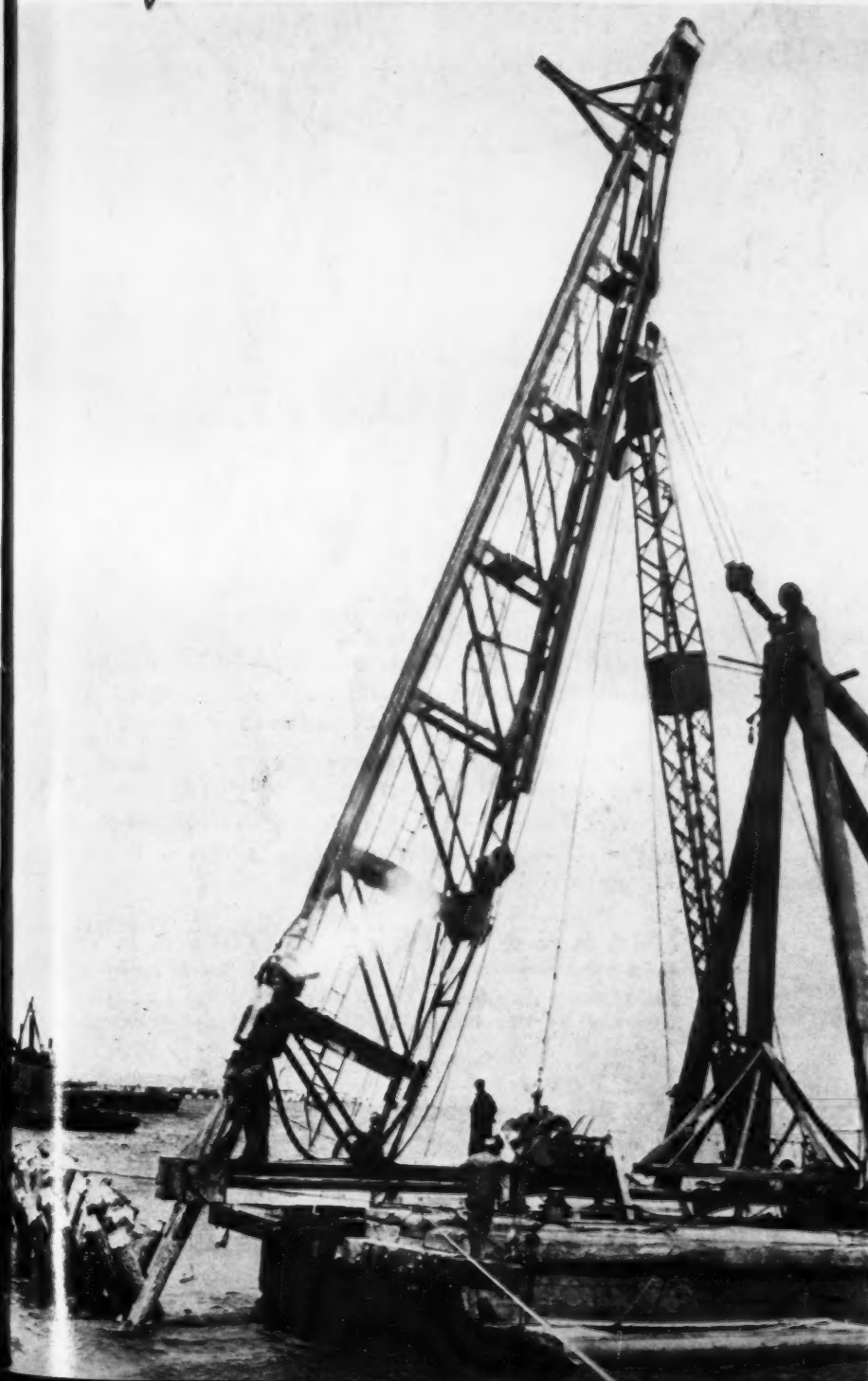


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DETROIT

Construction Methods

AUGUST 1946

QUICK-TILTING LEADS on derrick barge speed driving of batter piles



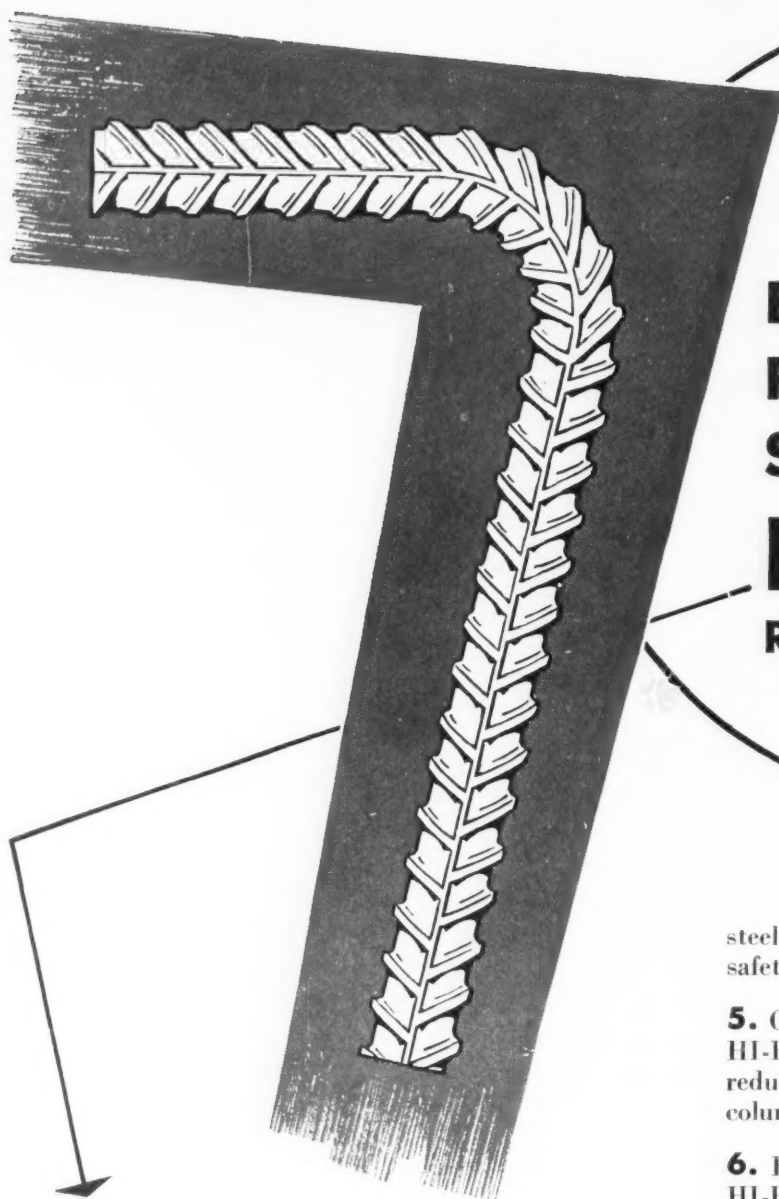
Street Railway Rebuilt Under Heavy Traffic

Heavy Steel Erection for Brazil Mill

Roofs on Two Industrial Buildings Raised and Lowered

Long Steel Piles Spliced by Welding

Draglines and Backhoes Cut Drain Ditches



seven important
**ENGINEERING
 REASONS FOR
 SPECIFYING
 HI-BOND
 REINFORCING BARS**

- 1. Higher Bonding Strength.**
 HI-BOND bars provide a substantial increase in bond value as compared with present day reinforcing bars.
- 2. Greater Mechanical Grip.**
 HI-BOND bars provide a more effective mechanical grip with the concrete irrespective of the position in which they are cast or the direction in which they are pulled.
- 3. Higher Stress Transfer.**
 HI-BOND bars provide a more efficient transfer of stress at splices and reduce the need for hook anchorage.
- 4. Better Crack Control.**
 HI-BOND bars materially reduce the width of cracks, thereby reducing the possibility of corrosion of the

steel at cracks and preserving the appearance and safety of reinforced concrete members.

- 5. Greater Resistance To Slip.**
 HI-BOND bars through superior resistance to slip reduce deflections of beams and deformations of columns.
- 6. Higher Design Stresses Possible.**
 HI-BOND bars will contribute to the effective use of high yield strength reinforcing steel and the further development of pre-stressed construction.
- 7. Lower Construction Costs.**
 HI-BOND bars in reinforced concrete will result in more efficient structures and in addition lower construction costs through conservation of materials and labor.

Write for bulletin "Engineering Tests Prove Bonding Strength of HI-BOND Reinforcing Bar."

Bars, Floor Plate, Piling, Plates, Rails, Reinforcing Bars, Sheets, Strip, Structurals, Tin Plate, Track Accessories.

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38 South Dearborn Street

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Sales Offices: Cincinnati • Detroit • Indianapolis
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INLAND HI-BOND
CONCRETE REINFORCING BARS

Cuts and Fills

PLEDGE of the Associated General Contractors of America meeting in Denver last month to resist unwarranted increases in construction costs states clearly the attitude of contractors in the current inflationary trend. Construction costs have gone up, but certainly not out of line with other products. Contractors are not at fault, for they are merely the means of assembling materials and the output of labor into permanent structures. Their costs are established by conditions over which they have little control. Instead of bids being overpriced, many current bids seem to fall short of reflecting the risks involved in taking a job under today's uncertainties.

★ ★ ★

APPOINTMENT of Maj. Gen. Robert Littlejohn as head of War Assets Administration may bring order out of the chaos of war surplus disposal. If not, official Washington is due for the biggest explosion of the war effort. Ugly rumors of black markets and racketeering in surplus goods and mismanagement in WAA are becoming too persistent to ignore. Meanwhile, Dick Chiles and his staff, in direct charge of handling construction equipment, are working their hearts out to do a good job, but they are enmeshed in red tape, changing regulations and failure of much equipment to be declared surplus. Geo. A. Fuller Co., New York building contractors, have been handed the job of getting rid of \$120,000,000 worth of materials and equipment in Utah as an experiment in management. Perhaps they can come up with a workable program. At least they should be able to avoid the recent spot sales fiascos witnessed at St. Louis and Cincinnati where practically everything offered was suddenly withdrawn just prior to the sales after a big promotion and advertising buildup.

★ ★ ★

THE INGENUITY of contractors sometimes astounds even those of us who are bumping into it all the time. Look at the article in this issue, "Roofs on Industrial Buildings Have Their Ups and Downs" if you want to see what we mean.

★ ★ ★

REPORTS of 490,000 dwelling units started in the first 6 months of the year show the housing program is progressing better than is generally realized. At that rate the 1946 goal of 1,200,000 units may be realized. However, completion time is being stretched from the normal 3 months to 5 or 6 months or even longer, so rate of new occupancy is falling behind. Incidentally, don't look for the two-thirds limitation on other building to be relaxed before October at least.

★ ★ ★

TOO BAD, but the ARBA has been forced to postpone the big post-war Road Show from 1947 to early 1948. Inability of manufacturers to produce new and improved models and renting of Chicago's Navy Pier, the proposed show site, by the University of Illinois are contributing factors in the postponement.

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AUGUST, 1946



HERE'S HOW IN THIS ISSUE

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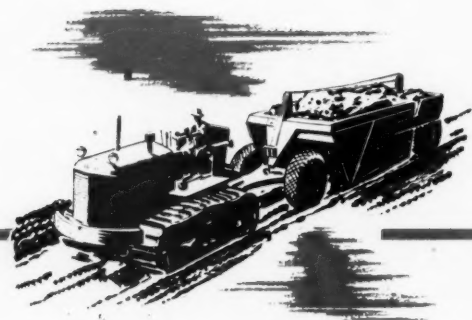
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You can't Beat this drum!

For sheer quality, you'll find it hard to beat the steering drums on an Oliver "Cletrac" crawler tractor. Made of the highest quality materials, drums are ground and polished to a high finish, providing maximum contact and longer life for the steering bands. They're another example of the extra quality built into Oliver "Cletracs."

The manufacturing knowledge of Oliver "Cletrac" engineers, the

modern production methods, and up-to-date equipment plus experienced, capable craftsmen, permit the addition of these high quality design features without the penalty of added cost to the user. Extra quality is standard on Oliver "Cletracs."

Maintenance of this standard enables your Oliver "Cletrac" dealer to offer you the finest in crawler tractors . . . for your every need.

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a product of
The OLIVER Corporation



Grinding steering drums to a high finish in the Oliver "Cletrac" plant

THE JOB JESTER

CARTOONS DRAWN FOR CONSTRUCTION METHODS



"The local politicians have opened the street so often, they decided to put a zipper on it."



"Hey! Your girder's slipping."

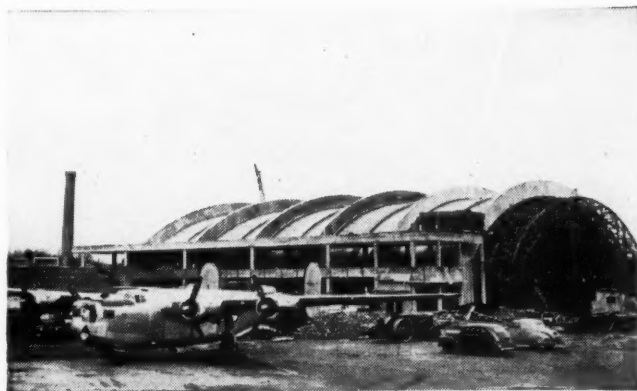


"Yes, we have had to pamper our operators a bit."

Flying Labs



GENERAL ELECTRIC BUILDS FIRE-SAFE, ALL-CONCRETE FLIGHT-TEST HANGAR WITH LONE STAR CEMENTS



AIR MAIL flown by jet-propelled P-80 to Washington, D. C.—370 miles in 49 minutes, at 460 miles an hour—marked the recent official opening at Schenectady, N. Y., of General Electric's new Flight Test Center. Here, GE's 'flying laboratories,' housed in a fire-safe, all-concrete hangar, are counted upon further to improve the jets and turbines used in this and other record-making flights.

Built by Corbetta Construction Co., New York, with Lone Star Cements, this new hangar, big enough to house four B-24's, is of barrel-arch construction, with 160 ft. clear span, providing utmost use of unobstructed floor space for testing jet, gas-turbine and electronic equipment. Engineers were Roberts & Schaefer, Chicago; Marcus T. Reynolds, Albany, N. Y., was the architect.

These days time is more expensive than ever. Save time—and money—by using 'Incor' 24-Hour Cement. Dependable 'Incor' high early strength reduces form requirements by 40% to 60%. Resulting savings are doubly important at today's lumber and labor costs. Plan new structures, additions and alterations with 'Incor'—get earlier completion at less cost.

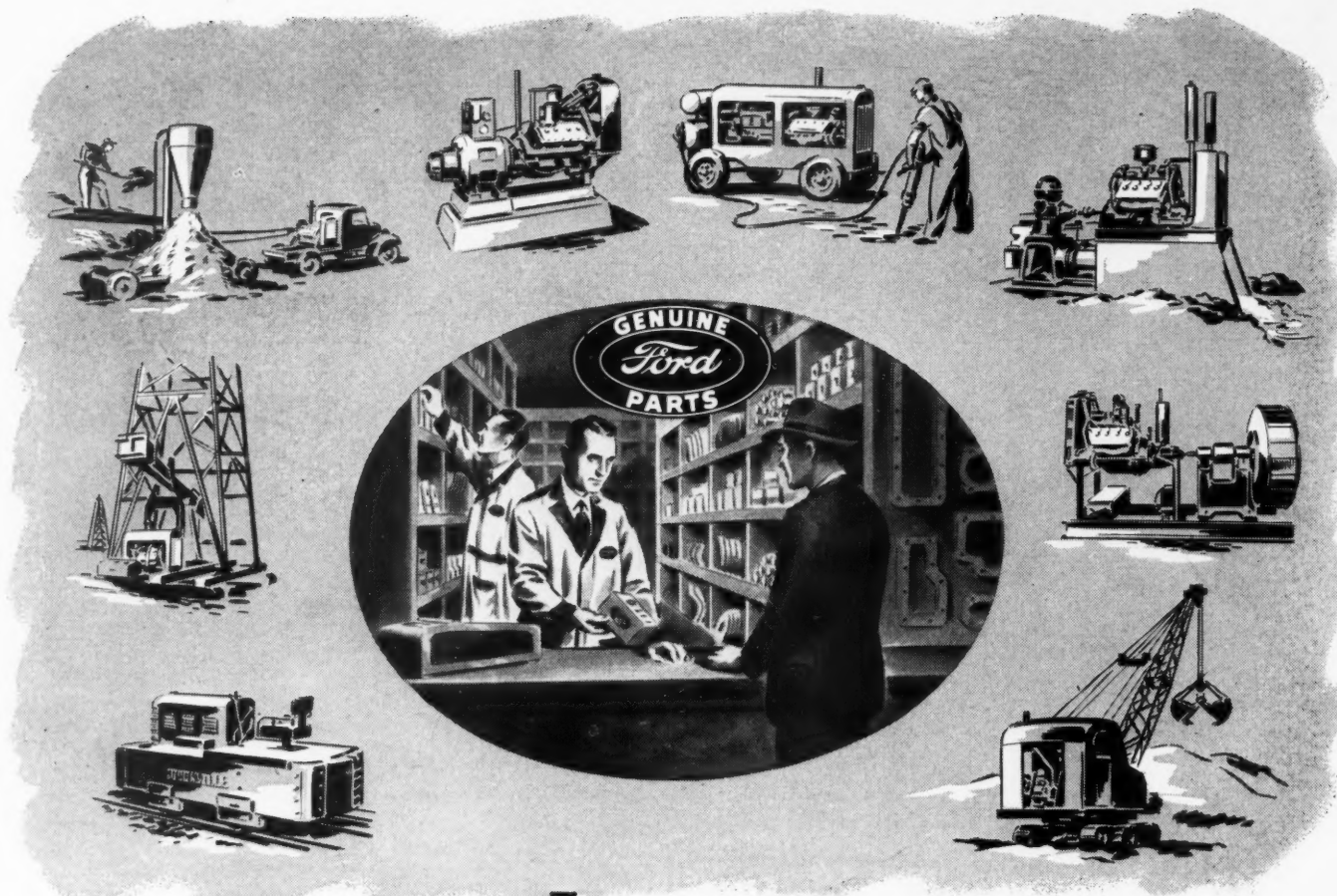
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PREFERRED! for the way they SERVE ... and the way they're SERVICED!

The more a man has to depend on any engine-driven industrial unit on the job, the bigger the advantages a Ford-built engine will give him.

Ford engine reliability, efficiency and economy are time-proved *facts*, known and accepted the world over. And when you back up these facts with famous, universal Ford Dealer Service, you have an unbeatable combination.

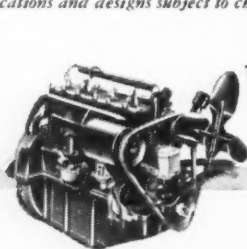
Thus, Ford-powered equipment is easier to sell. And the use of a Ford engine eliminates any need for the equipment manufacturer or distributor maintaining extensive engine service parts stocks. Ford Dealers and Parts Distributors gladly shoulder that responsibility.

You'll see more and more fine and popular

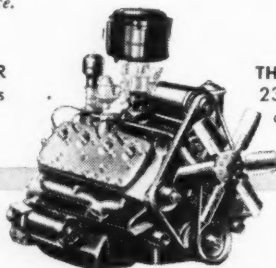
equipment powered with these great engines, now that they're available once more. Light plants, pumps, compressor units, portable power units, saw rigs, mills, blowers and many other pieces of equipment have been developed with Ford engines to furnish the sure-fire power.

The three popular Ford-built engines, shown below, are now available to manufacturers and individual purchasers. Each offers reliable, enduring power applicable to a wide range of uses. For detailed specifications and dimensional data, write—

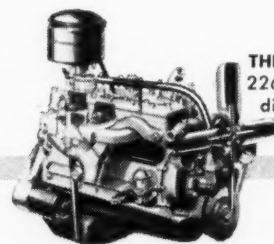
FORD MOTOR COMPANY
Industrial and Marine Division, Dept. 60
DEARBORN, MICHIGAN



THE 40-HP FOUR
119.5 cubic inches
displacement.



THE 100-HP V-8
239 cubic inches
displacement.



THE 90-HP SIX
226 cubic inches
displacement.

FORD-BUILT ENGINES

NOW AVAILABLE FOR INDUSTRIAL AND MARINE POWER



PRODUCING BALLAST *for the* UNION PACIFIC



For their large, modern ballast plant at Evanston, Wyoming, the Utah Sand and Gravel Products Corporation replaced a fleet of nine 5 cu. yd. trucks with four Bottom-Dump Euclids of 13 cu. yd. struck measure capacity. This reduced manpower requirements and effected substantial savings in maintenance and operation.

The Euclids are loaded with heavy gravel by a 3 yard shovel for a haul of 1200 ft. with a maximum adverse grade of about five per cent. Over an entire year's operation, these Bottom-Dump Euclids have averaged better than 11 round trips per hour with only minor repairs and normal replacements.

If you want hauling equipment that is designed and built for tough, off-the-highway service . . . that has proved its efficiency, long life and reliable performance and moves more material at lower cost . . . check Rear-Dump and Bottom-Dump Euclids for your requirements.

May we send you literature and specifications?

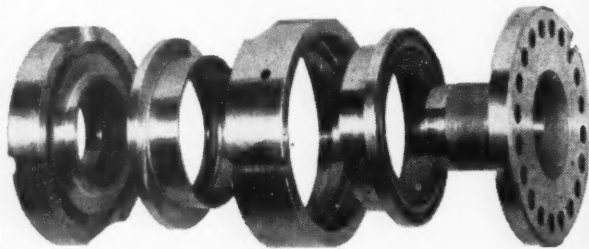
**THE EUCLID ROAD
MACHINERY COMPANY**
CLEVELAND 17, OHIO



MAKES TOUGH JOBS EASY!

DUAL VALVE

used exclusively on
SULLIVAN DRILLS



The exclusive Sullivan Dual Valve is a big factor in the outstanding efficiency of Sullivan Drills. It steps up drilling productivity because it makes air do more work. The Dual Valve provides positive air control on both strokes of piston, giving exact, "cushion control."



THE SULLIVAN LIGHTWEIGHT WAGON DRILL

Pneumatic tire equipped, positive locking brakes and adjustable frame... increases footage 50 to 80% with mounted 55 to 75 pound hand drills.

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Joy Engineer*

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JOY MANUFACTURING CO.

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W&D R500

A development of
B.F. Goodrich
FIRST IN RUBBER



Users report tire life almost tripled with this new type construction

WHEN an operator's records show an average of 4571 hours per tire — compared to 1600 from another make — that's news that can mean real money-savings for you. The tires that set that record were B.F. Goodrich Universals, like those pictured above. And here's the story back of it.

B.F. Goodrich engineers studied the problems of traction and bruising — found the answers. First, they designed a tread with thick, heavy lugs that protect the undertread. But they designed the tread so that the natural running action pushes mud and dirt toward the edges. The tire gives first-rate traction in *either* direction. It stays clean, resists side slippage.

Then, an entirely new construction principle was developed — the *shock shield*. This shield is a set of four breakers — layers of rubber-coated rayon cords — built in between the tread and the plies. These breakers are in pairs, with the cords in each pair running parallel to each other, but with each pair running in opposite directions to give balanced strength. The breakers are cushioned with thick layers of special shock-resistant rubber.

Under impact, the cords in the breakers stretch together, *not* across each other, and return to their original position. The blow is *distributed* and absorbed by the rubber cushions; the shock passed on to the cord body is greatly reduced.

Users of Universals and of other B.F. Goodrich off-the-road tires built with shock-shield protection report fewer bruises, lower repair bills, longer wear, and say that more tires can be retreaded. Find out how these tires — designed to meet your needs — can make greater savings for you. See the B.F. Goodrich dealer, or write us direct. *The B.F. Goodrich Company, Akron, Ohio.*

Truck Tires BY
B.F. Goodrich



a long time since we roped this crane

Yes . . . Quite a long time. So long I'd just about forgotten the make of the rope.

So I said, "It's still in good shape, but I better find out where we bought it. We'll order another for a spare."

I looked it up. It was Purple Strand rope. It had been in service even longer than I figured. That's the brand we'll use on our jobs hereafter—all of 'em.

Bethlehem's Purple Strand is the ideal wire rope for heavy loads. It's built of premium steel, and it's tough . . . long-lasting . . . trustworthy. Buy it for cranes, hoists, and other machines engaged in severe lifting and handling service. It's built in many sizes, but all have the same high quality.

When you think WIRE ROPE

. . . think BETHLEHEM



NORTHWEST

*Still
the
Standard*

The entire attention of the Northwest Engineering Department has been devoted to the design, improvement and production of Shovels, Cranes, Draglines and Pull-shovels—machines definitely related to each other.

In conversations with contractors, engineers, highway department men and other equipment salesmen, you will find that these machines have become standards of comparison wherever you go. This is just one of the many things that have made one out of every three Northwests a repeat order.

**NORTHWEST
ENGINEERING COMPANY**
1728 Steger Building
28 E. Jackson Blvd., Chicago 4, Ill.

**...TOWARD
WHICH OTHERS
BUILD!**

*-and
when you have
a real Rock Shovel
you won't have
to worry about
putting in dirt*

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

WHY LEADING CONTRACTORS

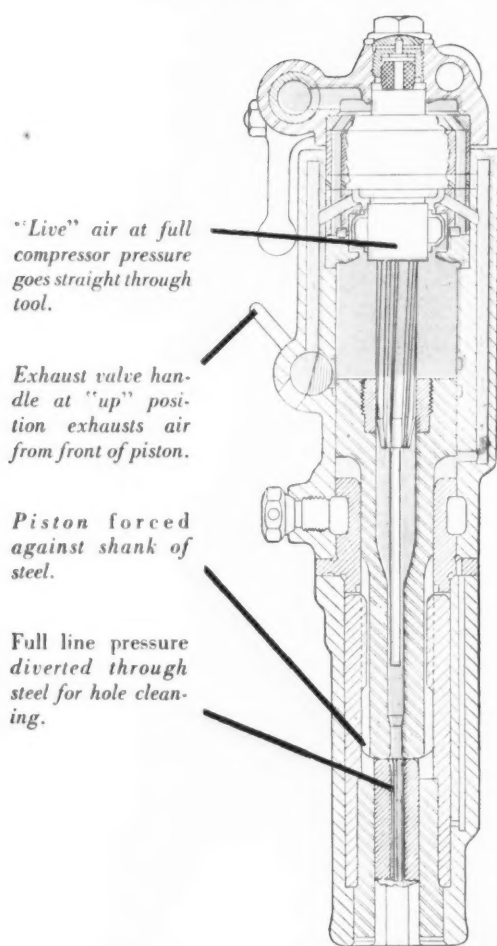
SPECIFY

Thor

ROCK DRILLS



DETAIL DRAWING SHOWS
Thor SINKER ROCK DRILL
IN "BLOWING" ACTION



*The FOREMAN knows
Thor's "Straight-line" design
provides extra blowing
power to keep the hole
clean and speed drilling*

Exceptional Hole Cleaning ability is a major reason why Thor Sinker Rock Drills perform at peak efficiency to give more footage per shift. "Straight-line" design, as shown at the left, puts compressed air at full pressure directly through the center of the steel to the drilling face. This heavy blast—controlled by the drill runner—blows the hole clean and adds to the penetration rate. This efficient blowing prevents "stuck steels."

This same efficient use of air power, automatically controlled through Thor's short-travel, tubular valve, provides powerful rotation and harder piston-hammer blows that result in superior drilling speed. Prove this yourself on your own work. Your nearby Thor distributor will be glad to arrange a demonstration.

INDEPENDENT PNEUMATIC TOOL COMPANY

600 West Jackson Boulevard, Chicago 6, Illinois

Birmingham Boston Buffalo Cleveland Detroit Los Angeles Milwaukee New York Philadelphia
Pittsburgh St. Louis Salt Lake City San Francisco Toronto, Canada London, England

Thor

PORTABLE POWER

TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

TRUSCON TRU-CURE

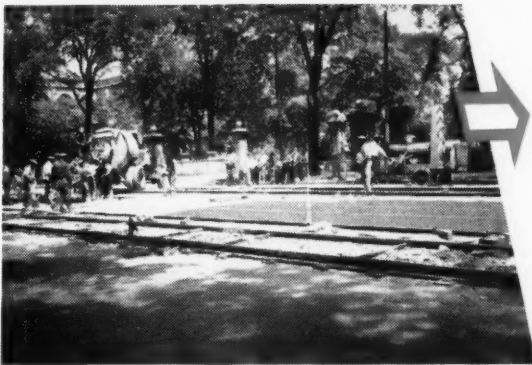
THE
**FAST, EFFICIENT
LOW-COST**
CURE FOR CONCRETE!



On cement walks and patch jobs all that's needed for curing is an ordinary insecticide sprayer such as the worker in photo (left) is using. No cleaning up afterward.

For minimum evaporation loss and better cured concrete—for savings in labor, time and material—use TRUSCON TRU-CURE. Curing is simply and easily applied by spray immediately after finishing—no waiting. Provides 97% water retention in the critical first 24 hours. That means a job free from crazing and hair checks—insures hardness, strength, durability.

Meets Specifications of State Highway Departments and U. S. Army Engineers



On big jobs the "wand" type sprayer is used with portable compressor. TRU-CURE is available as clear liquid or with fugitive dye for easy inspection.

At the left you see a typical recent TRUSCON TRU-CURE job in progress. The workman with the "wand" type sprayer is right on the heels of the finishers. TRU-CURE may be had with a fugitive dye, permitting the operator to prevent thin spots—insuring an *even* protective, water-seal coating. No bags, no paper, burlap or cotton mats needed.

Curing Keeps Up With the Pouring



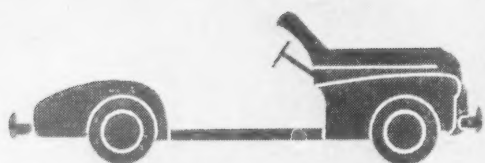
In the progress picture at left you see the concrete mixer pouring just ahead of the curing application. This is the time, labor and material saving process—reasons that have brought approval from U. S. War Department Engineers and State Highway Engineers. Nothing bulky to handle, no waiting, no uneven curing. There is no coal tar, pitch or asphalt in TRUSCON TRU-CURE.

Spray It On—The Curing Is Finished—No After Care

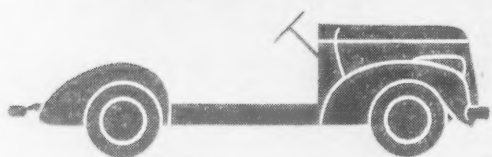


Contractors on big road jobs have welcomed the special Truscon Spray Machine, a 9-nozzle applicator that does the job swiftly, economically, scientifically. Sprayer, as in photo at left, operates from a bridge spanning the work. For description of this machine and complete data on TRU-CURE write Dept. N.

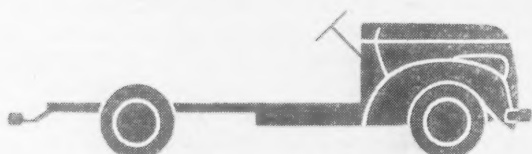
TRUSCON LABORATORIES
Affiliate of Devoe & Reynolds Co.
DETROIT, MICHIGAN



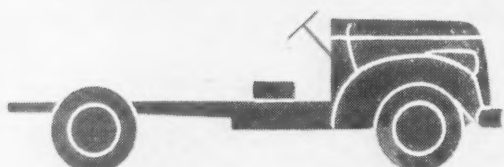
116-inch Wheelbase—One Model



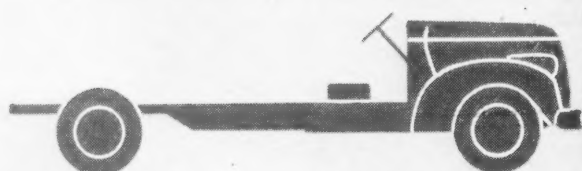
115-inch Wheelbase—Ten Models



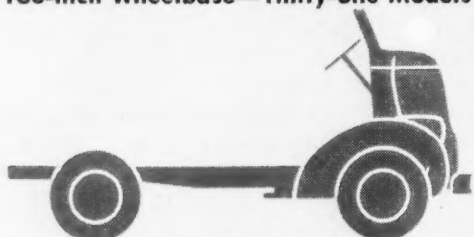
125 1/4-inch Wheelbase—Nine Models



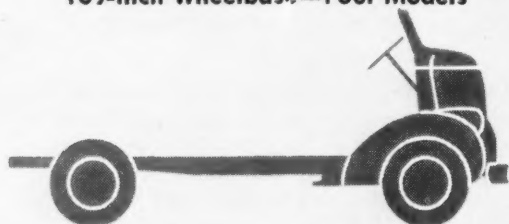
134 1/2-inch Wheelbase—Thirty-four Models



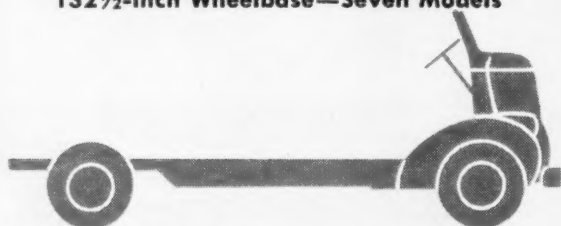
160-inch Wheelbase—Thirty-one Models



109-inch Wheelbase—Four Models



132 1/2-inch Wheelbase—Seven Models



158-inch Wheelbase—Two Models



195-inch Wheelbase—One Model (School Bus)

**WHATEVER
YOUR BUSINESS
THERE'S A
CHEVROLET
TRUCK
TO FIT YOUR
HAULING
NEEDS**

99 MODELS

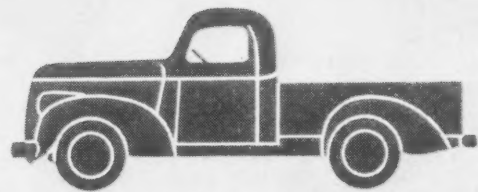
9 WHEELBASES



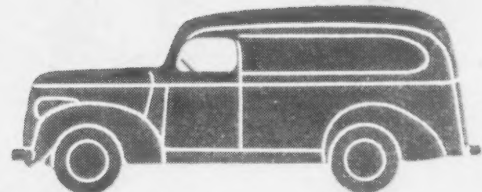
The only business that can't profitably use a Chevrolet truck is a business that needs no truck at all—for Chevrolet's expanded line, which now comprises 99 models on nine wheelbases, ranges from the beautifully styled Sedan Delivery to ruggedly massive models in the heavy-duty class. Newly added to the truck line are heavy-duty models of increased load capacity. . . . Among Chevrolet's 99 models on nine wheelbases—some with the standard Thrift-Master engine, some with the high-torque Load-Master engine—there is a truck to fit your requirements. . . . Whether you use a standard type of body, a special-purpose body, or specialized mechanical equipment, there is a Chevrolet to serve your needs and save you money.

CHEVROLET MOTOR DIVISION
General Motors Corporation
DETROIT 2, MICHIGAN

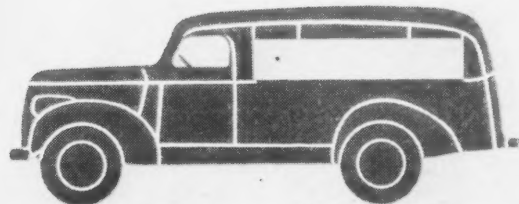
**SEE YOUR CHEVROLET DEALER
HE CAN SUPPLY SPECIAL BODIES AND
EQUIPMENT FOR ANY HAULING JOB**



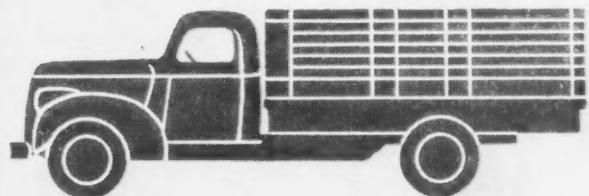
Pick-up—Four Models on Three Wheelbases



Panel—Five Models on Four Wheelbases



**Canopy Express—Three Models
on Two Wheelbases**



Stake—Fourteen Models on Five Wheelbases

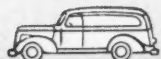


High Rack—Four Models on Two Wheelbases

CHEVROLET TRUCKS



PICK-UPS



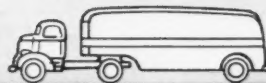
PANELS



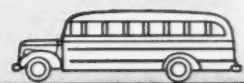
STAKES



CAB-OVER-ENGINE

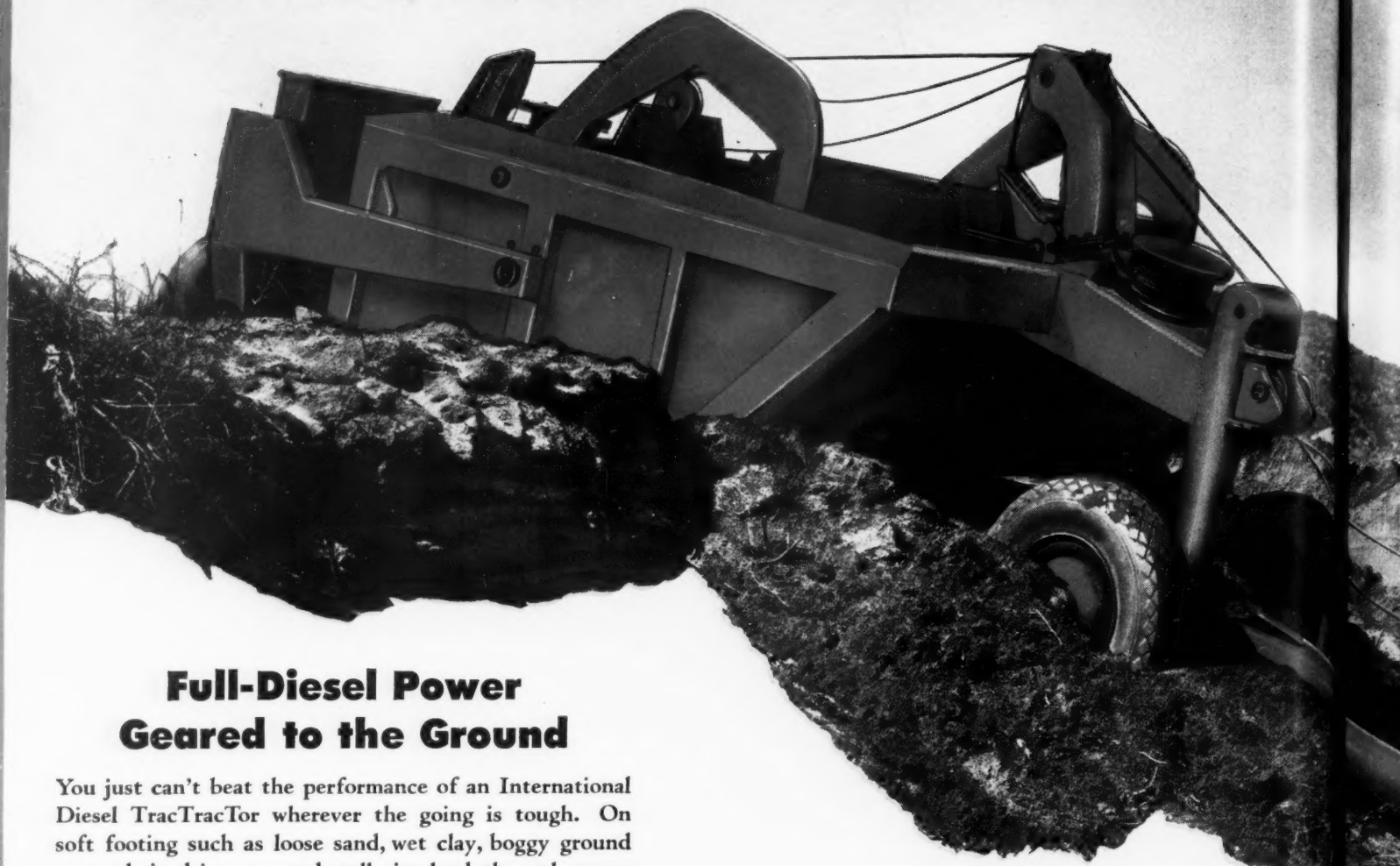


TRACTOR-TRUCKS AND CHASSIS FOR SPECIAL EQUIPMENT



99 MODELS • 9 WHEELBASES • THE RIGHT TRUCKS FOR ALL TRADES

INTERNATIONAL



Full-Diesel Power Geared to the Ground

You just can't beat the performance of an International Diesel TracTracTor wherever the going is tough. On soft footing such as loose sand, wet clay, boggy ground or mud, it drives on and pulls its load through as no other type of tractor can do. This ability to take hold and convert power into pull, regardless of footing, yields profits. More work is packed into each hour otherwise wasted in idleness or expensive maneuvering.

Beyond this immediate benefit is the long-range money-satisfaction of International's unbeatable operating economy. For example, the advanced-design fuel injection and combustion system of International Diesels extract the last ounce of power from fuel consumed. This keeps fuel costs down to bedrock, assures longer life for the engine. Sturdy construction and matchless service accessibility of every part of the tractor reduce maintenance to the minimum, avoid unnecessary and expensive down time.

Add to these the many other superior features of International TracTracTor design and operation—which the nearest International Industrial Power Distributor is prepared to explain and demonstrate. You'll agree that, for the tough jobs in earth-moving, construction,

lifting, carrying and excavating, International Diesel Crawlers are unbeatable. They provide the kind of traction that takes hold, that assures maximum power at drawbar or 'dozer blade under every conceivable working condition.

You'll be ahead, with this combination: International Diesel TracTracTors and the matched equipment available through International Industrial Power Distributors. Yes, you'll be ahead in many ways—in lower-cost power, in time-saving performance with equipment tailored to your operations. That's why it will pay to standardize on International Tractors, Power Units and International-powered equipment. Look into the profit possibilities of their use on the jobs you're planning, now.

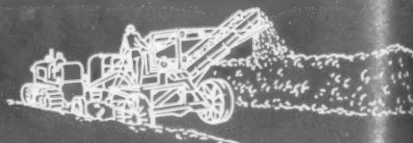
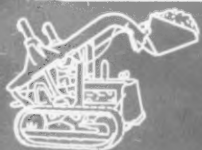
Industrial Power Division

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue

Chicago 1, Illinois

Listen to "Harvest of Stars" Every Sunday, 2 p. m., E. S. T.! NBC Network



TRACTRACTORS

Provide effective traction
for **MAXIMUM POWER**



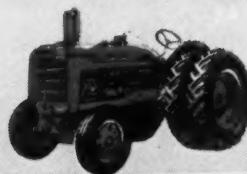
INTERNATIONAL *Industrial Power*



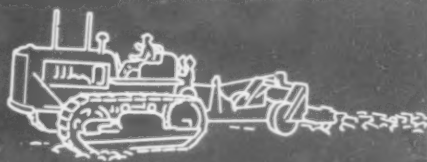
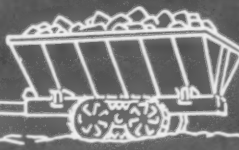
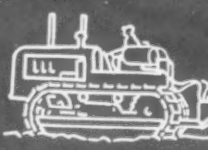
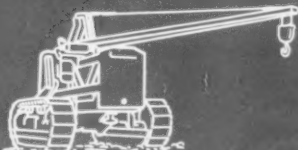
TRACTRACTORS



POWER UNITS



WHEEL TRACTORS



PROTECTING WIRE ROPE AND OPEN GEARS

*How it's done on
this "Bigger Digger"*

INTERNATIONAL Minerals & Chemical Corporation operate this giant drag-line, said to be the world's largest, in the mining of phosphates in Florida. They say:

"We are using Texaco products in the lubrication of the 'Bigger Digger', and have a regular lubrication schedule posted on the machine in several places. We are using Texaco Crater No. 1 on hoist cables, circle rails and rollers; and Crater No. 3 on open gears, and hoist and boom cable drum faces."

Texaco Crater has been used by operators everywhere for more than 30 years. Crater is especially designed to keep wire rope in prime condition. It fights friction, reduces wear, and prevents rust. It *penetrates* . . . preserves the core and keeps rope flexible and strong longer.

On open gears, Texaco Crater assures equally effective lubrication. It cushions shocks, protects against heavy loads, quiets noise, and greatly reduces wear.

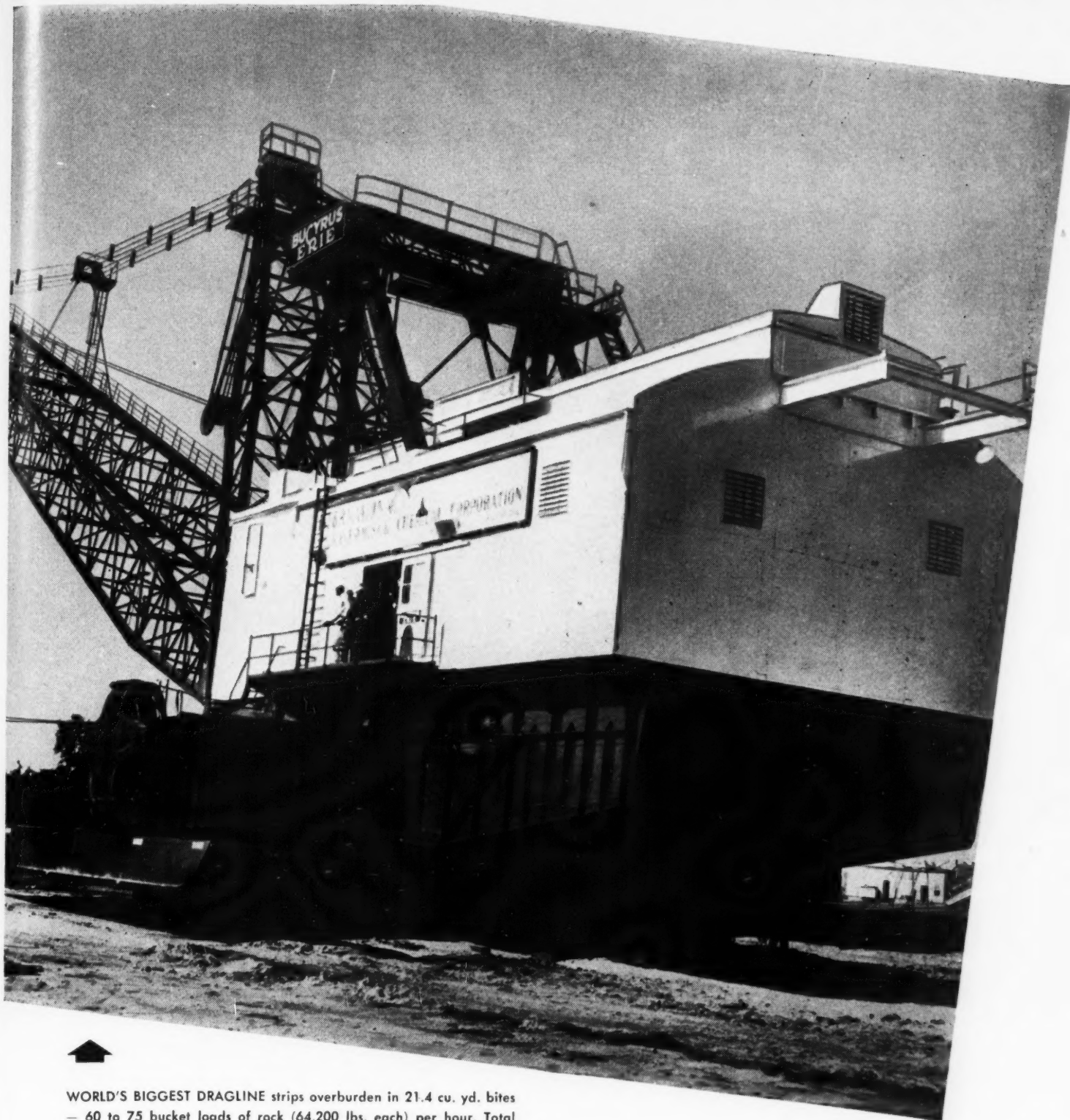
For Texaco Products and Lubrication Engineering Service, call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TUNE IN THE
TEXACO STAR THEATRE
WITH JAMES MELTON
EVERY SUNDAY NIGHT
— CBS



TEXACO



WORLD'S BIGGEST DRAGLINE strips overburden in 21.4 cu. yd. bites — 60 to 75 bucket loads of rock (64,200 lbs. each) per hour. Total weight is 2,571,000 lbs.; boom 215 ft. long; walking speed 0.11 m.p.h.; combined horsepower 1,750; largest rope diameter 2¼ in. Wire rope and open gears are protected with Texaco Crater.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

RODGERS "Sixty" TON SHOP PRESS

for shops... that want to save..

Time and Labor on jobs like:

**Pressing, Shearing, Bending,
Straightening, Clamping
and Assembly**

MOVABLE CYLINDER

Cylinder is adjustable across top bolster—mounted on four rollers that ride the bolster channel. Ram travel $2\frac{1}{2}$ " per stroke of pump. Cylinder detaches from press for use as a jack, etc.

WIDE WIDTH — 45"

Working space on bolsters (45") permits the entrance of large gears, wheels or pulleys. 10" opening between front and back bolster.

ADJUSTABLE 8" to 38"

Working daylight between top and lower bolster adjustable from 8" minimum to 38" maximum. Bolster is raised and lowered by a hand crank.

END OPENING — 8"

Long work may be slid through either end of the press. The opening between the columns is a full 8".

HANDY VALVE & GAUGE

The hydraulic gauge marked in pounds and tons and the quick opening valve are located at the right side of the press for convenience.

2-SPEED PUMP

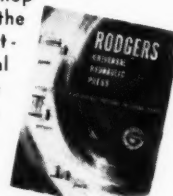
2-Speed pump, sturdy, self lubricating. Ram moves $2\frac{1}{2}$ " each stroke when pump is set for high speed—giving up to 2,000 lbs. pressure in rapid travel. Flip of lever changes pump to high pressure.

FLOOR SPACE ONLY 38"x70"

The "Sixty" requires small amount of floor space, only 38"x70".

OTHER RODGERS PRESSES

... are described in this catalog. Included are the Rodgers 100 ton and 150 ton Shop Presses, and the Rodgers Portable Universal Press. Write for your copy.



Shop Presses

Rodgers Hydraulic, Inc.

hydraulic power equipment

7403 Walker St., St. Louis Park, Minneapolis 16, Minn.



Crawler-Track Presses



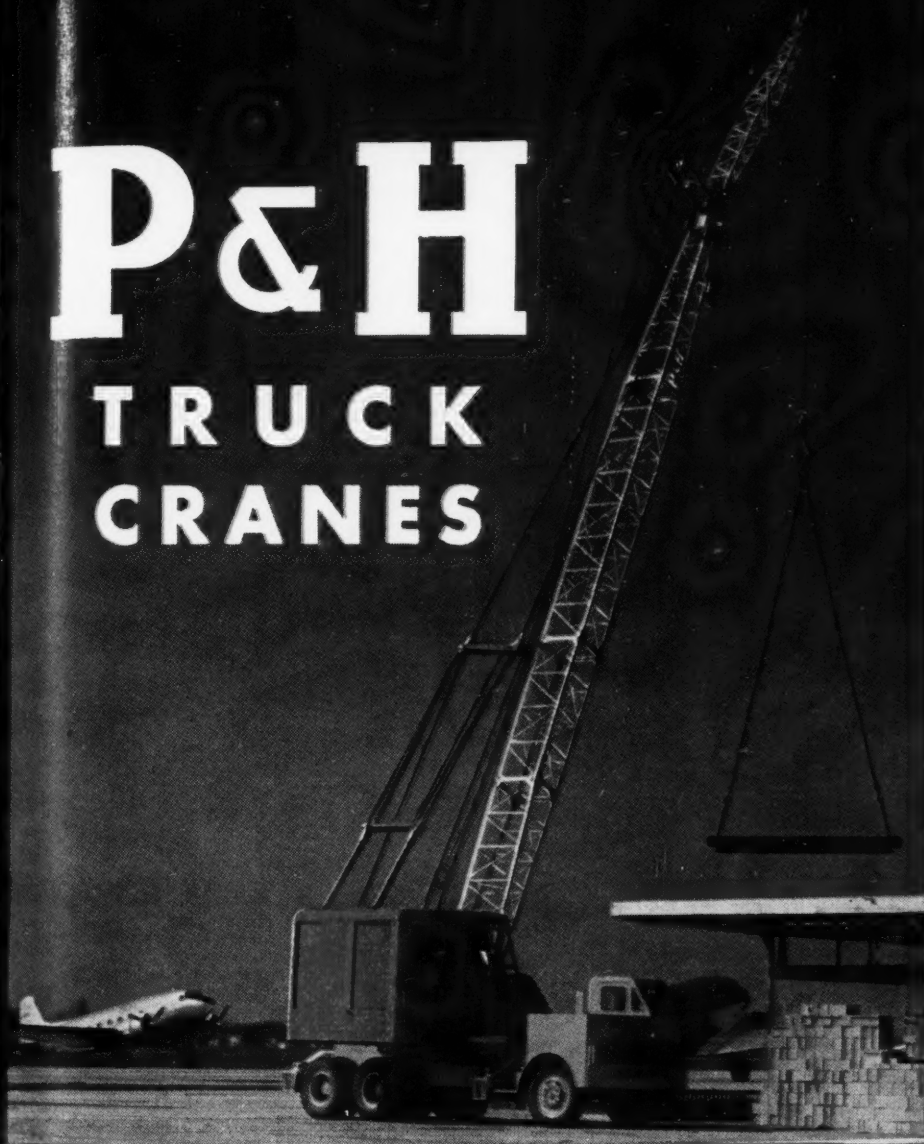
Power Pump Units



Portable Presses

P&H

TRUCK CRANES



▲ Above: "Size for size, no P&H Truck Crane has ever been outlifted!" Here a heavy steel girder is gently moved from flat car to trailer . . . evidence not only of the truck crane's power, but of the "inching" made possible by Planetary load lowering.

➤ Right: P&H Truck Cranes "take 'em as they come" — like this job, which calls for accurate placing of big batches of concrete. Tomorrow this same machine may be lifting out the forms . . . then speeding miles away to start a new excavation. (See bottom of page for the many P&H Truck Crane applications.)



ALWAYS READY FOR A *quick take-off!*

Yes, this new P&H Truck Crane is right at home in fast company. For it's a high speed traveler — always ready for a *quick take-off* to the next assignment — across town or across the state — wherever there's heavy work to be done.

Dual power does it. One engine geared for travel . . . another engine for load handling. Less time between jobs — more performance on the job!

Whether it's crane, dragline, shovel, or other work, this dual power combination is a sure bet for lower handling costs. Write for full details.

P&H *Added Values*

- Hydraulic Control — a new peak in operating ease and safety.
- Greater stability — with exclusive torsion bar-mounted front axles and lower center of gravity.
- Independent Planetary boom hoist — raises or lowers boom smoothly, with or without load.
- Planetary load lowering — permits "inching" of loads, accurately.
- All-welded construction — greater strength. Weave-proof frame eliminates sway at boom point.

P&H REMOTE CONTROL AVAILABLE

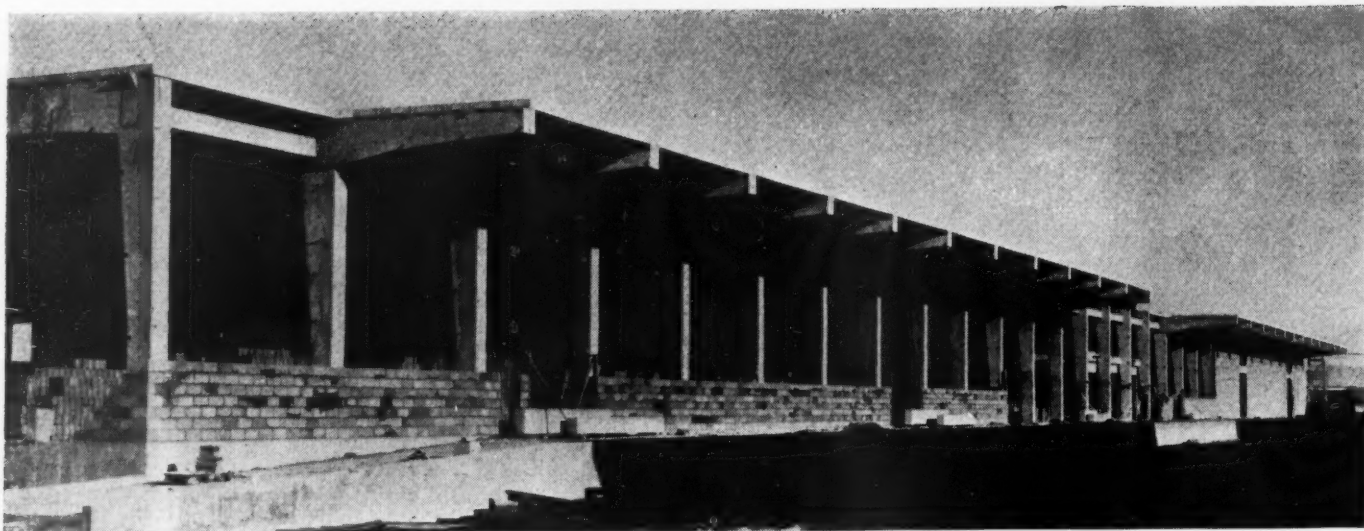
With this unit you can control all carrier movements (even the horn) by electric push buttons — from operator's position inside the crane cab.

HARNISCHFEGER
CORPORATION

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS  HOISTS • WELDING ELECTRODES • MOTORS

General Offices: 4494 W. National Ave., Milwaukee 14, Wis.



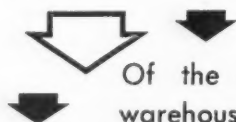


Framing of one warehouse 200' x 600' of precast structural members was completed in 40 days and a second in only 18 days.

SPEEDY-LOW COST-CONSTRUCTION

with

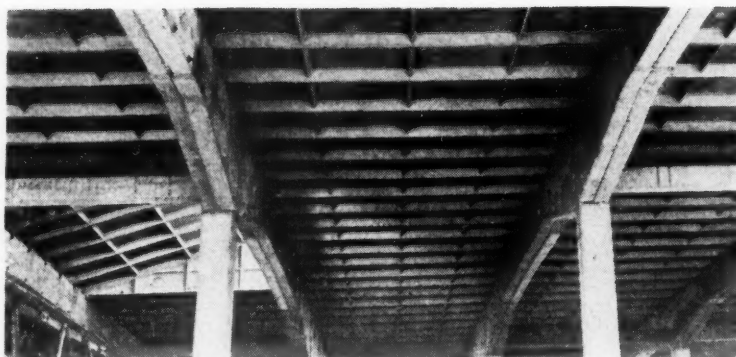
VACUUM CONCRETE PRECAST SYSTEM



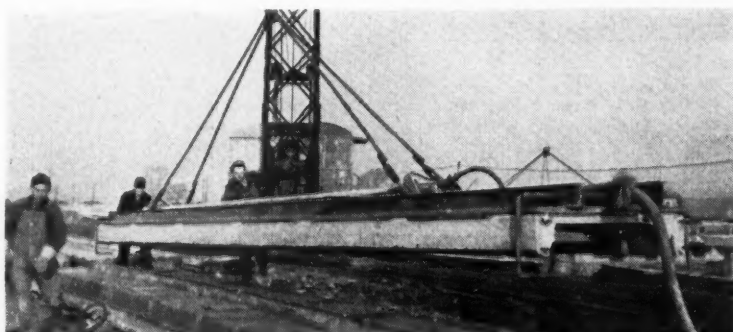
Of the construction of the warehouse illustrated above, Engineering News-Record wrote:

"Precast concrete roof slabs and hollow-box rigid frames made rapid erection of two, one-story warehouses at Mechanicsburg, Pa., possible at relatively low cost. These members, made with high early strength cement and drained of excess water by the vacuum process, were lifted from the forms within 24 hr. after casting by suction pads composed of light steel frames faced with plywood and bordered with soft rubber gaskets. Ingenious assembly methods speeded erection."

Methods used in construction were by Vacuum Concrete, Inc., who can help you, too, in speeding up your construction work.



Roof panels precast integrally with slab span 20 ft. between precast rigid frames of hollow-box section.



Half of rigid-frame girder was lifted from concrete mold by the Vacuum Concrete Lifter less than day after casting and ready for bolting

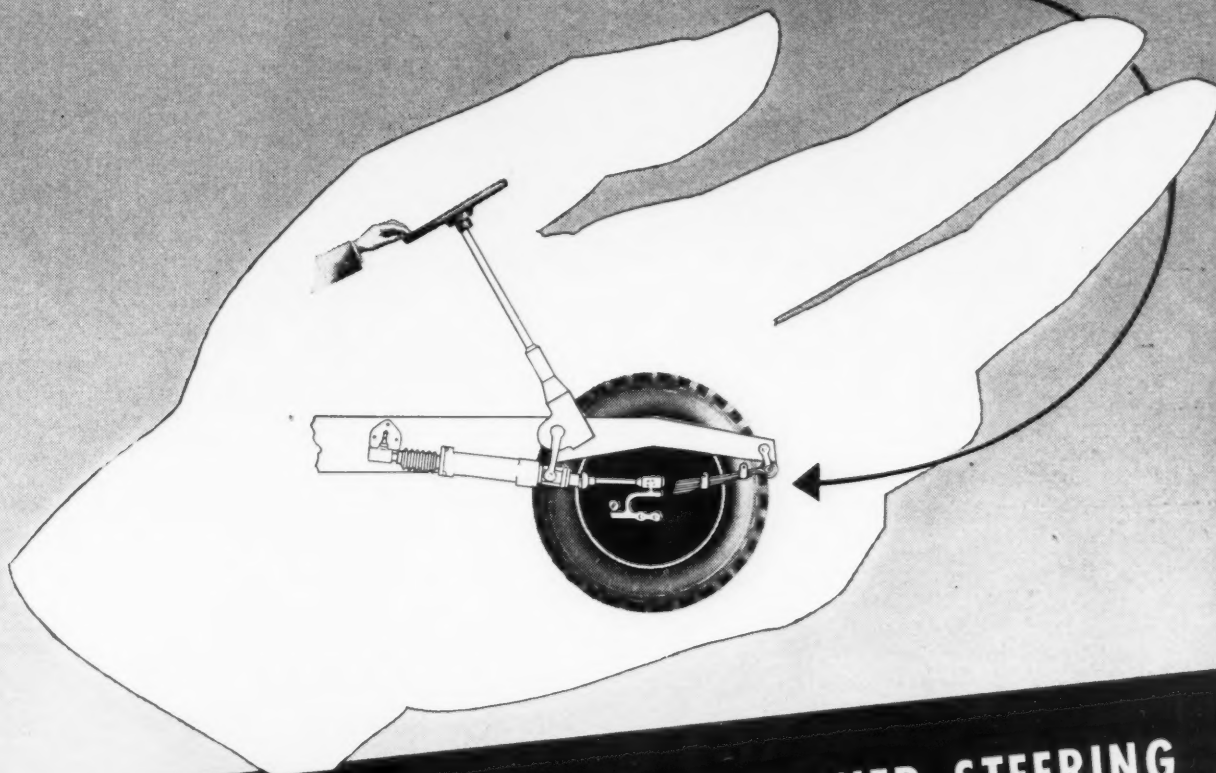


For full details, write today.

VACUUM CONCRETE, INC.

4210 SANSOM STREET, PHILADELPHIA 4, PENNSYLVANIA

INSTANTANEOUS FINGER-TIP RESPONSE



with **VICKERS** HYDRAULIC POWER STEERING

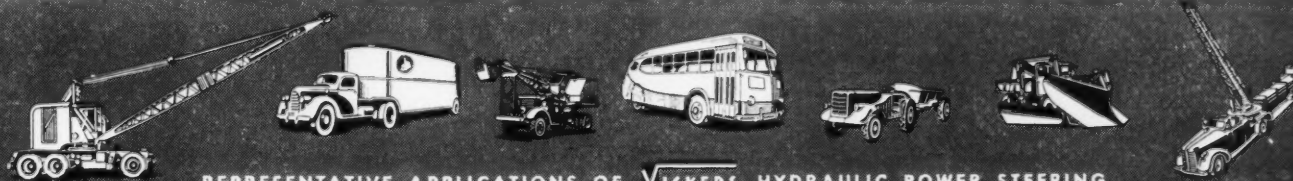
Two fingers on the steering wheel—it turns easily, and the front wheels of the heaviest truck or bus follow exactly. Vickers Hydraulic Power Steering does the work. And steering is just as easy over the roughest ground off the road as it is on smooth concrete. Road shock cannot be transmitted from the front wheels to the steering wheel or driver.

Steering is instantly responsive and firm—no rubbery feeling or wander. The driver is relieved of the

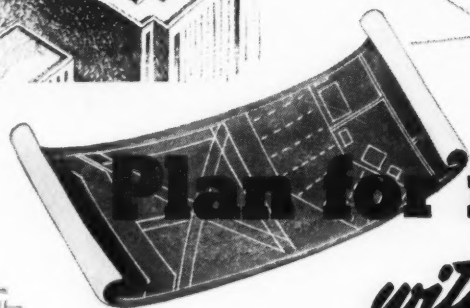
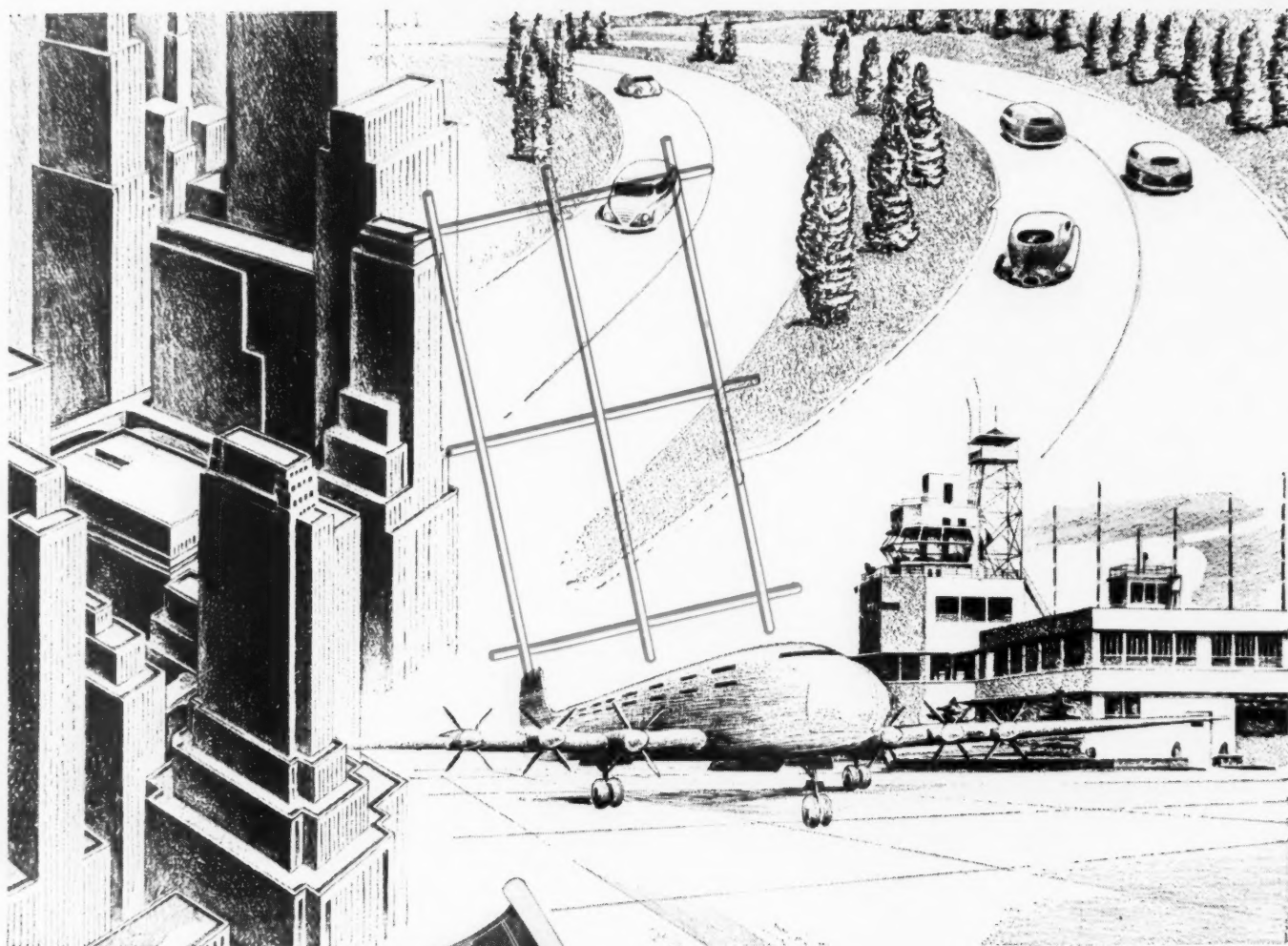
most exhausting part of his job, enabling him to get more done with less fatigue.

Vickers Hydraulic Power Steering has many other advantages: (1) requires minimum space and is applied to most existing hand steering mechanisms with a few simple alterations; (2) automatic protection against abuse and excessive steering reaction forces; (3) automatic lubrication; (4) 15 years of successful operating experience. Ask for Bulletin 44-30.

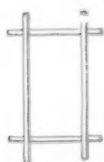
VICKERS Incorporated • 1494 OAKMAN BLVD. • DETROIT 32, MICHIGAN
 Application Engineering Offices: CHICAGO • CINCINNATI • CLEVELAND • DETROIT • LOS ANGELES • NEWARK • PHILADELPHIA
 ROCHESTER • ROCKFORD • TULSA • WORCESTER



REPRESENTATIVE APPLICATIONS OF **VICKERS** HYDRAULIC POWER STEERING



Plan for tomorrow with this *Proven Fabric*



At our busiest airports, on our best paved streets and highways, in our tallest buildings, you can see how concrete construction contributes to modern living.

Welded Wire Fabric, the most vital factor in concrete construction, is invisible in the concrete slab, but imparts the strength and stamina to control cracks that may form in concrete.

American Welded Wire Fabric is the most widely used prefabricated concrete reinforcement. Its closely spaced steel wires are electrically welded into a prefabricated mat which fortifies against major stresses and strains.

Many additional uses of concrete will be made possible by the ability of this versatile reinforcement to meet new requirements. So when you are planning for tomorrow, it will pay you to know *all* of the ways you can use American Welded Wire Fabric. For wherever it is practical, it is also economical.

LISTEN TO . . . the "Hour of Mystery" presented by United States Steel on the radio every Sunday evening. Consult your newspaper for time and station.



American Steel & Wire Company

Cleveland, Chicago and New York

*Columbia Steel Company, San Francisco,
Pacific Coast Distributors*

*Tennessee Coal, Iron & Railroad Company, Birmingham
Southern Distributors*

United States Steel Export Company, New York

UNITED STATES STEEL

5,000,000 GALLONS



NEVER A MINUTE LOST!

OTHER PRODUCTS:

- ASPHALT DISTRIBUTORS
- TAR KETTLES
- MAINTENANCE DISTRIBUTORS
- BURNERS
- STREET FLUSHERS
- SPRAY UNITS
- SUPPLY TANKS
- SURFACE HEATERS
- SHOULDER ROLLERS and Agricultural Equipment



The owner of the STANDARD STEEL DISTRIBUTOR MODEL 424 pictured above, reports the following after hard usage on many jobs and never a minute lost —

First: No time was lost in loading—Model 424 can be loaded in half the time required by other distributors.

Second: The distributor worked so far ahead of the gravel gang, it was idle 40% of the time waiting for the gang to catch up.

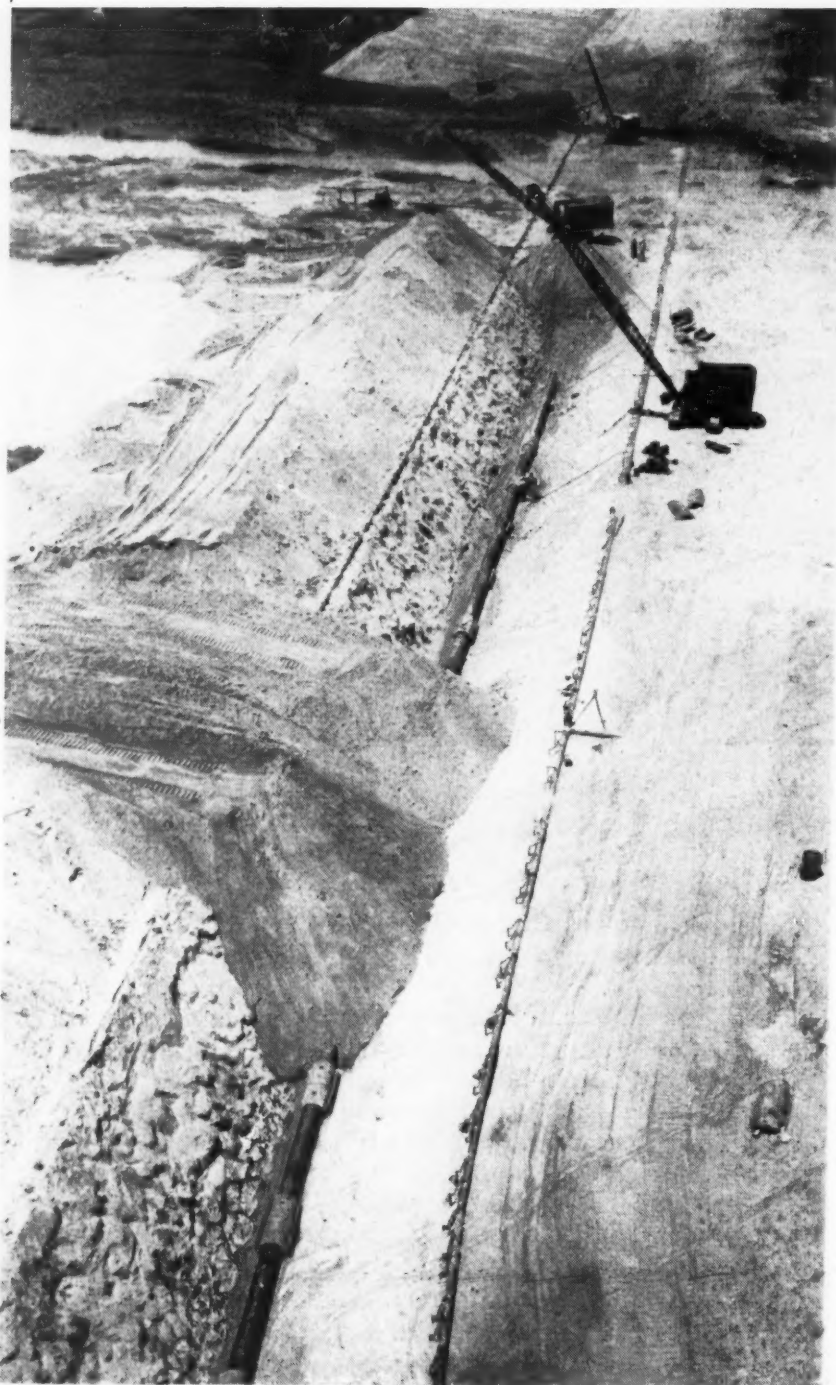
REASONS: The two way cleaning system enables operator to clean out pump, spray-bar and entire piping system easily and in quick time...the large strainer always keeps the nozzle clean...and no time is lost on tinkering and removing parts to thaw out and clean.

WRITE TODAY for the name of your nearest dealer.

Standard Steel Works

NORTH KANSAS CITY, MO., U.S.A.

Why Worry about Water?



Let MORETRENCH Handle it!

Here's a bird's-eye view of how your work can look, if a MORETRENCH WELL-POINT SYSTEM is taking care of the water.

Dry digging means a fast-moving, economical job. No use worrying about water—get MORETRENCH and forget about it!

● Pipeline River Crossing—
Liberal, Kansas

MORETRENCH CORPORATION

90 WEST STREET, NEW YORK 6
ROCKAWAY, NEW JERSEY

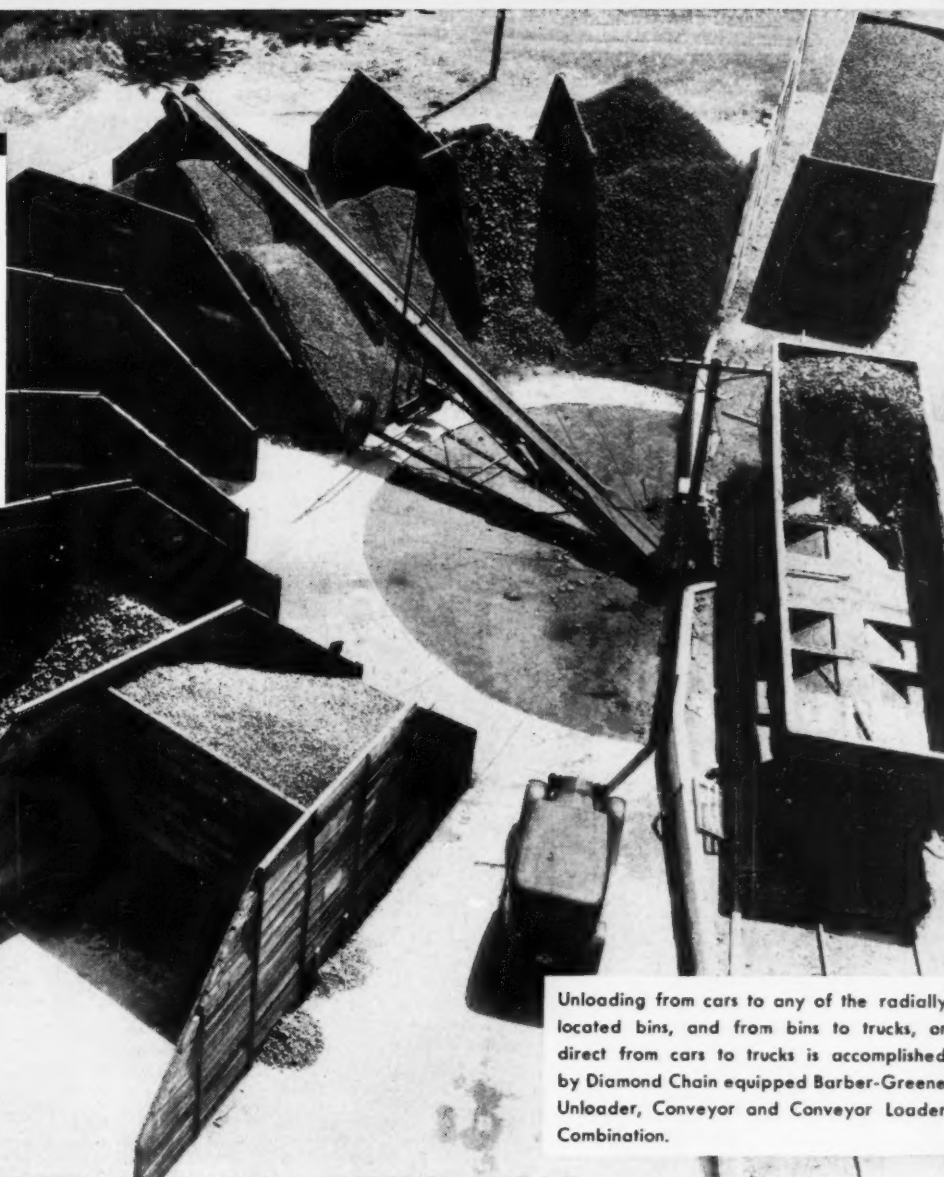
HOUSTON 8, TEX.
315 W. 25th St.

TAMPA 6, FLA.
2424 Chicago Ave.

CHICAGO 23, ILL.
3037 So. Christiana Ave.

ADAPTABILITY

*—a feature of
BARBER-GREENE
equipment*



Unloading from cars to any of the radially located bins, and from bins to trucks, or direct from cars to trucks is accomplished by Diamond Chain equipped Barber-Greene Unloader, Conveyor and Conveyor Loader Combination.

—and of DIAMOND ROLLER CHAINS

Equipment for loading, unloading, conveying, trench digging, earth removal, and bituminous construction must have wide *adaptability* to perform time- and labor-saving functions efficiently.

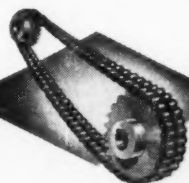
On such widely adaptable, long-life service equipment as made by Barber-Greene, drives of wide *adaptability* and reserve strength are well suited—Diamond Roller Chain Drives. They are used for power drives from motors and engines—for short and long center shaft-to-shaft drives, for machine operations, and conveyor mechanisms. Diamond Chains are adaptable to high speeds or low, great capacities or fractional horse-

powers—always performing efficiently, accurately—steadily—without slip or friction.

Known to users of machinery for lasting uniform performance—engineers, designers and builders of America's finest machinery and equipment have applied Diamond Roller Chains for many years to a wide variety of uses.

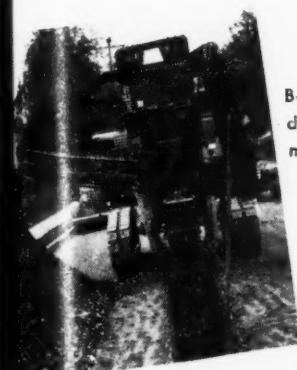
Helpful suggestions by our experienced engineering staff may help save your time. Drive Data Cat. 595 will be mailed on request. DIAMOND CHAIN COMPANY, Inc., Dept. 418, 402 Kentucky Avenue, Indianapolis 7, Indiana. Offices and Distributors in All Principal Cities.

DIAMOND



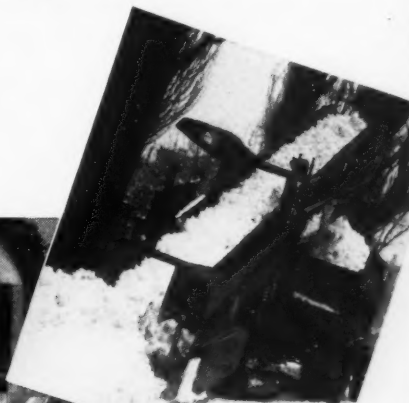
ROLLER CHAINS

595 contains drive data. on request.



B-G Ditcher using Diamond No. 478 and double 470 Roller Chains, digs and removes soil at high speed.

B-G Central Plant mixes road binder and surface courses. On the Dryer, Mixer and Gradation Unit, Diamond Drives are used.



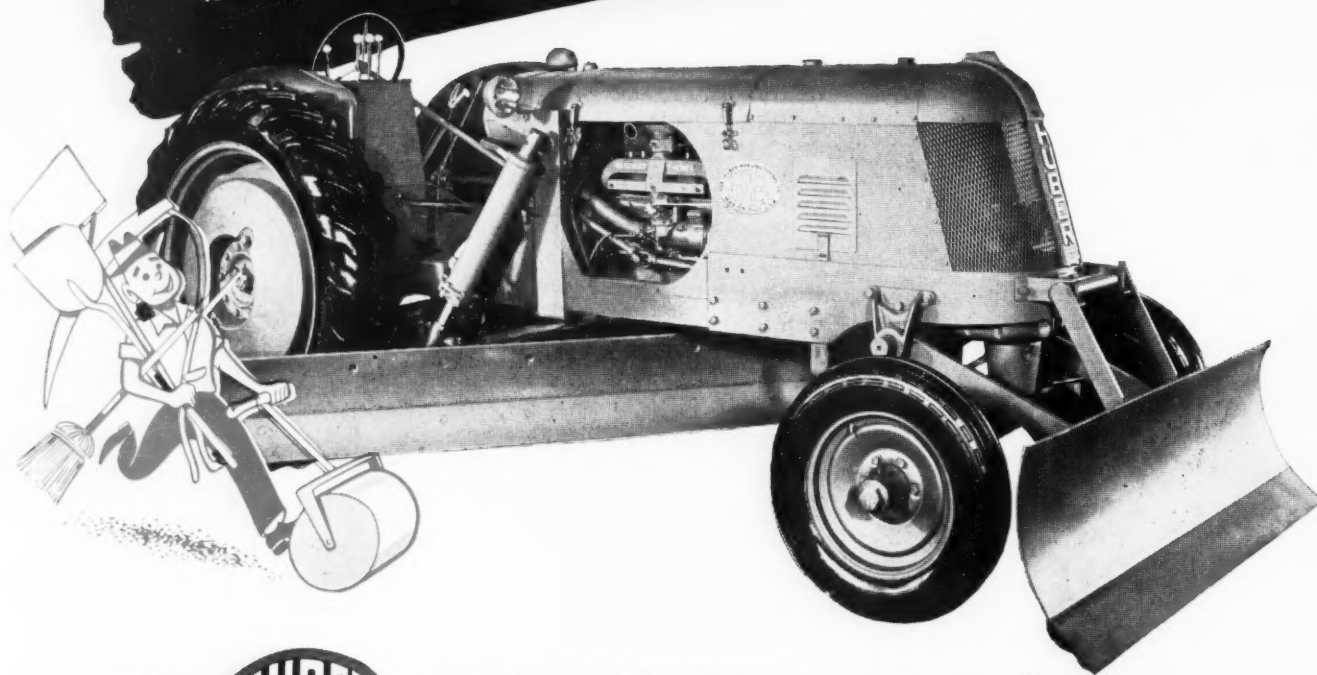
Four sizes of Diamond Chains used for drives on this B-G Snow-Loader.

8 MACHINES IN ONE!

THAT'S THE HUBER MAINTAINER

a machine that offers more downright money and timesaving advantages than it was thought possible to build into one piece of equipment in the past. Check the modern HUBER MAINTAINER for: versatility in operation; economy; dependable performance; long-life service. Only one man is required to operate it in all of its duties. Then, put this ONE-MAN MAINTENANCE CREW to work the moment you can get your hands on one. Keep in touch with your local dealer.

- 1 Maintainer
- 2 Mower
- 3 Bulldozer
- 4 Lift-Loader
- 5 Patch Roller
- 6 V-Type Snowplow
- 7 One-Way Snowplow
- 8 Rotary Broom



THE **HUBER** MFG. COMPANY • MARION, OHIO, U. S. A.

HUBER MAINTAINER

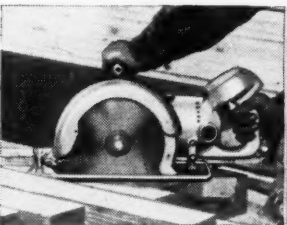
ALSO 3 WHEEL AND TANDEM ROLLERS

Build Them Faster

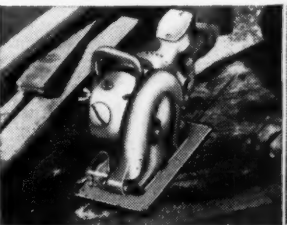
"Quick-Saws"



CUTTING STAIR STRINGERS with an Electric Quick-Saw finishes the job in a fraction of the time required by hand.



CUTTING RAFTERS is another important construction job you'll do faster, cleaner with a B & D Electric Quick-Saw.



LAYING SUB-FLOORING calls for the compact cutting action you get with a streamlined B & D Electric Quick-Saw.

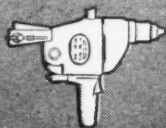
SAW FASTER . . . build faster . . . the two go hand-in-hand when you use Black & Decker Electric "Quick-Saws!" They'll help you keep construction projects rolling. They'll save you time, money, muscle, manpower. They'll turn out your jobs *ten times faster* than hand-sawing.

Quick-Saws can be equipped with 10 different types of blades and discs to speed up every kind of cutting operation in wood, metal, stone and composition materials. They are adjusted quickly, easily for angle or depth of cut. They cut cleanly and accurately. They're streamlined and weight-saving, give

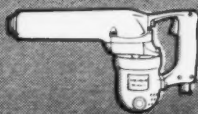
top performance whether in your shop or on the job. They operate from standard power lines or portable generators.

Check your nearby Black & Decker Distributor today on Quick-Saws, Electric Drills, Hammers and Shears and the other Black & Decker Portable Electric Tools for faster construction work. Due to the heavy demand, he may not always have them in stock . . . but ask him for full details now. And write today for your copy of our illustrated "Electric Saw Handbook." It's free and you'll find it helpful. The Black & Decker Mfg. Co., 659 Pennsylvania Ave., Towson 4, Md.

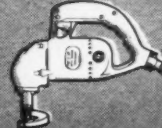
FASTER WORK WITH THESE TOOLS, TOO!



ELECTRIC DRILLS . . . in capacities from $\frac{1}{8}$ " to $1\frac{1}{4}$ " to speed up all drilling, boring and hole-sawing, in wood or metal.



ELECTRIC HAMMERS . . . handle all drilling and channelling in concrete, stone, brick; tamp and vibrate concrete forms.



PORTO-SHEARS . . . put new zip into sheet metal work; make cleaner, smoother and more accurate cuts, easier.

LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker

PORTABLE ELECTRIC TOOLS



General Purpose, Wide Rehandling, Heavy Duty Digging Types, $\frac{3}{4}$ to $2\frac{1}{2}$ Yard Sizes.

ALL-WELDED ALL-MODERN

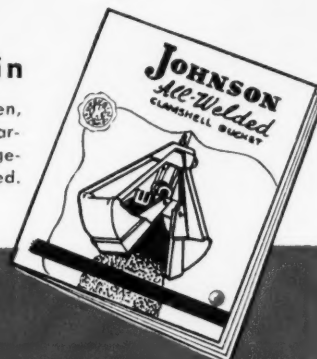
Heavier lips, sides, bottoms, plus big payloads

Johnson adds extra strength at every point of wear. Modern welded construction eliminates weight of rivets and tie plates. Just that much extra steel reinforces the lips, sides and bottoms of every Johnson All-Welded Bucket.

Heavy lips, sides and bottoms lower the center of gravity. Maximum weight close to the teeth gets maximum penetration, bigger bites. Because bucket balance is improved, Johnson Buckets hit the dirt standing up, bite in with both sets of teeth. Because obstructing bolts and rivet heads are out, their slick, smooth clams dump fast. Even sticky materials slide right out.

Get your new Bulletin

Full story on these additional advantages: Keen, hard manganese lip edges... needle bearings on closing shaves... clams interchangeable... lower sheaves completely protected.



THE C. S. JOHNSON COMPANY
Koehring Subsidiary • Champaign, Illinois

**IDEAL FOR
CITY WORK...**

**Parsons
221
TRENCHLINER**



The new Parsons 221 Trenchliner, public service model in the Parsons line of trenchers, sidesteps surface obstructions as close as 10" to either side of the projected trench. Boom shifts from side to side across entire width of boom carriage. Easy to shift, because it rides smoothly on big diameter rollers. Arc type spoil conveyor reaches up 6' 9", easily dumps into $1\frac{1}{2}$ -ton trucks.

THE PARSONS COMPANY
KOEHRING SUBSIDIARY • NEWTON, IOWA



**HIGH STEPPING FRONT AXLE TAKES
THE TWIST OUT OF HAUL ROAD TRAVEL**

Strip mine haul roads aren't boulevards. But twisting strains of ruts and furrows can't get at Dumptor frames, can't make steering tough for Dumptor drivers. Oscillating action of the steering axle, pivot anchored to the frame at one point only, rides along with the strain. Twist is absorbed before it can distort the frame. Heavy leaf springs cushion vertical shocks. Nickel steel I beam is the heavy-duty backbone of the assembly.

KOEHRING COMPANY *Milwaukee 10, Wis*

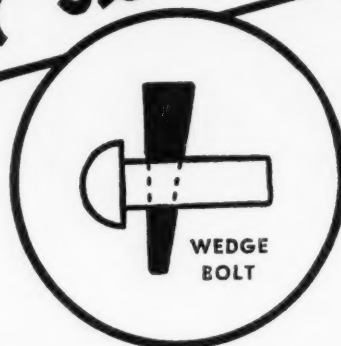


Dumptor can climb 21" furrow without frame distortion. Free oscillating front axle, spring mounted, absorbs twisting strains.

HEAVY-DUTY CONSTRUCTION EQUIPMENT



Look!
NO FINIS!
Atlas "Finless" Speed Forms

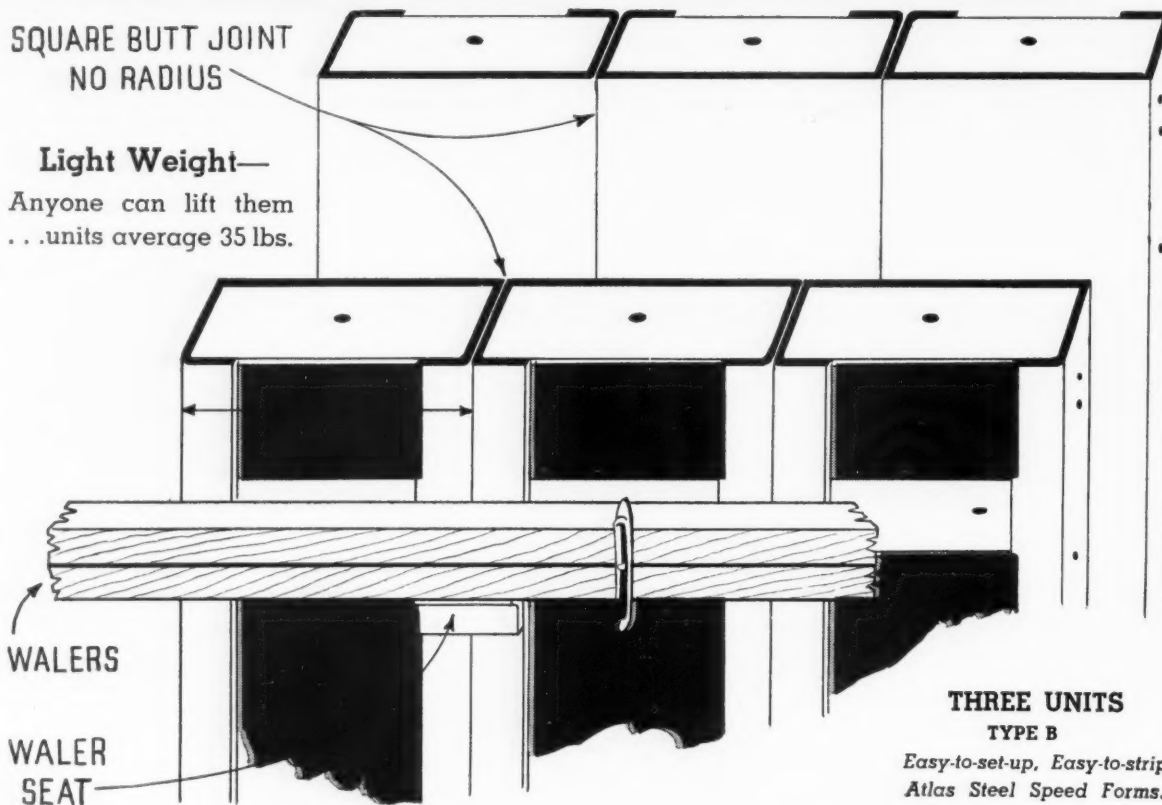


**SMOOTH WALLS AND FLOORS
Require No Finishing**

Quick Assembly—Units go together with no-thread wedge bolts.

New Process for Concrete Construction

**For Rent
or Sale**



Fast Erection—
cuts down Form Costs
and Stripping.

**AVAILABLE FOR
EARLY DELIVERY**

Write Dept. CM
43 Cedar St., N. Y.

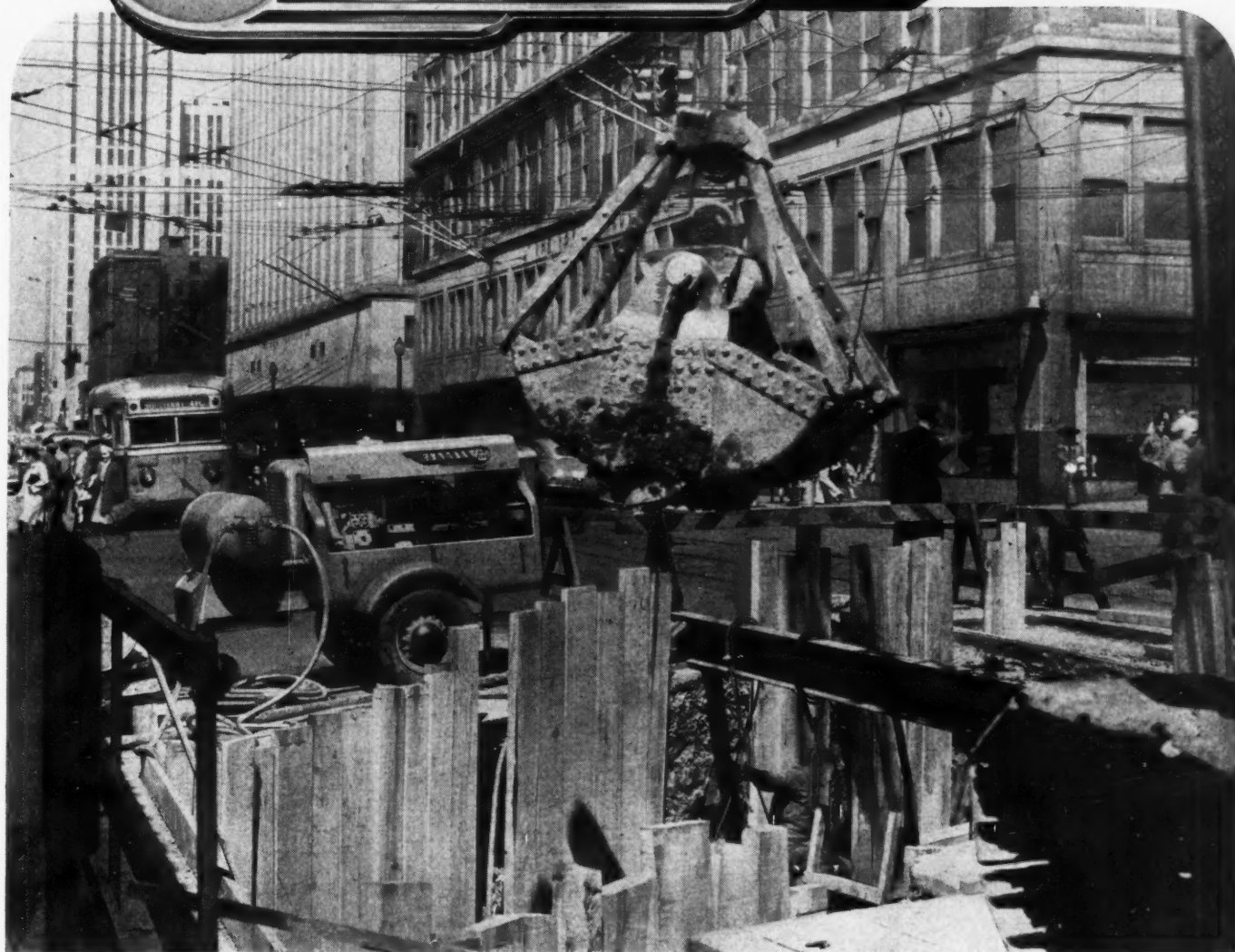
260 Lato St.
Irvington, N. Y.

Irvington
**FORM AND TANK
CORP.**

Atlas Labor-Saving Concrete Forms for every Purpose

**AIR
PLUS**

JAEGER COMPRESSOR



No place for a horse-and-buggy compressor

That constant power-packed wallop of a Jaeger Compressor behind your tools makes a real difference when you're fighting time to save dollars and finish the job. Built to the same micro-precision as the latest Caterpillar, International and Continental engines which power them, these "AIR PLUS" units unfailingly deliver all the air that's called for, at cooler temperatures and with less cost in fuel and upkeep than any compressor you have ever owned.

Ask your Jaeger distributor or write us for Catalog JC-5, the up-to-date buyer's guide on air compressors from 60 to 500 cu. ft.

THE JAEGER MACHINE COMPANY, Columbus 16, Ohio

**REGIONAL
OFFICES:**

8 E. 48th St.
NEW YORK 17, N. Y.

226 N. LaSalle St.
CHICAGO 1, ILL.

235-38 Martin Bldg.
BIRMINGHAM 1, ALA.

JAEGER

Engineered **EQUIPMENT**



"FLEET-FOOT"
Loaders



"SPEEDLINE"
Concrete Mixers



"SURE PRIME"
Contractors Pumps

JAEGER-LAKEWOOD SPREADERS, FINISHERS AND BITUMINOUS
PAVERS, FORMS, FORM TAMPERS—"DUAL-MIX" TRUCK MIXERS,
AGITATORS—JAEGER HOISTING ENGINES, TOWERS

EXTRA-DUTY OIL *for*



SINCLAIR
OPALINE
TBT MOTOR OIL

Made especially
for this kind
of service

EXTRA-DUTY SERVICE

Equipment operating under *unusual* service conditions needs an *unusual extra-duty* motor oil for top performance efficiency.

Sinclair *Opaline TBT Motor Oil* is made for sustained load, high temperature operation. Fortifying additives, to supplement special refinery treatment, are used in TBT to combat oxidation, bearing corrosion, and foaming. Detergent dispersal qualities tend to keep engines clean and free from varnish and carbonaceous deposits.

Opaline TBT Motor Oil is available in grades to suit varied engine designs and operating requirements. Try this *extra-duty* oil for *extra-duty* gasoline engine service. Use Sinclair Tenol for Diesel equipment.

SINCLAIR AUTOMOTIVE OILS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

Put These Pictures *into ACTION*



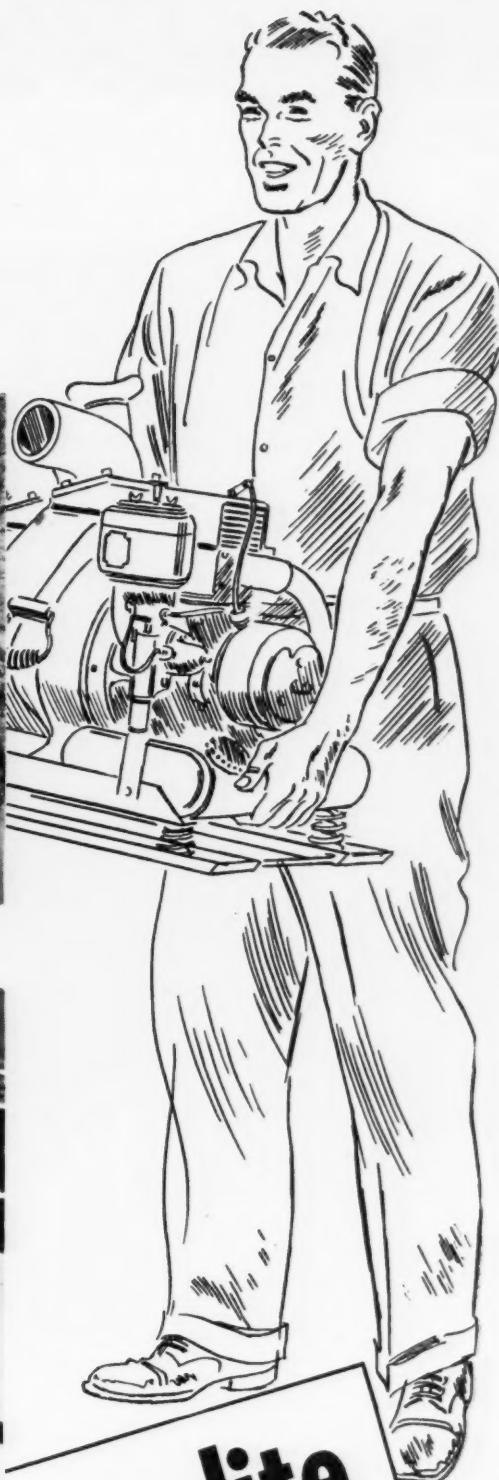
Above — Pump out water faster . . . handle heavy liquids and solids easier . . . with a fast self-priming Homelite Portable Pump.

Below — Operate electric tools . . . saws, grinders, drills and many others . . . with a Homelite Portable Generator. Use it also for floodlights on night jobs.



Do you want to see these pictures come to life? Do you want to see how you, like thousands of others, can cut operation costs . . . get more work done in less time . . . with Homelite Portable Gasoline-Engine-Driven Pumps and Generators?

Then write, *now*, and ask us to have a Homelite Representative arrange to give you a free demonstration. Without obligation to you in any way, he'll show you, *right on your job*, Homelite Portable Pumps and Generators *in action*. You ask him questions. Run the units yourself. You can find out everything you want to know about their design and operation. You can see, for yourself, just what you can expect in on-the-job performance. Write today.



Homelite
CORPORATION
Port Chester, New York
**Portable Pumps
Generators and
Blowers**
GASOLINE-ENGINE-DRIVEN

Mittry Bros. use **TOURNAPULLS** ON TOUGH CANYONH



Tournapulls get heaping loads of rocky gravel in steep, heavy cuts.

660,000 cubic yard highway project proves **TOURNAPULLS'** ability to handle steep grades, tough materials, 200 to 2000' hauls

Mittry Bros., Los Angeles, are using 4 Tournapulls to build 3 miles of 4-lane highway connecting San Diego with highway to Escondido and Riverside, California. New route, up a canyon, underpasses University and Washington Avenues, reaching San Diego at city level. This job presented construction conditions as varied and difficult as they come.

Hauls over 15-35% downgrade, 15-25% upgrade

Because material is cut from the top edge of the canyon and filled in at the bottom, all hauls are up and down grade all the way . . . they range from 200 to 2000'. Mittry's Tournapulls are cutting 30' off the top edge . . . haul heaped loads down 15 to 35% grades . . . spread their loads and return empty up 15 to 25% grades to the cut.

Tournapulls get heaped loads in light sand to loose rock

Material over entire job varies from light sandy, almost powdered soil, through clay, gravel to loose rock up to

8" diameter. The tougher sections of the cut are rooted for fast loading.

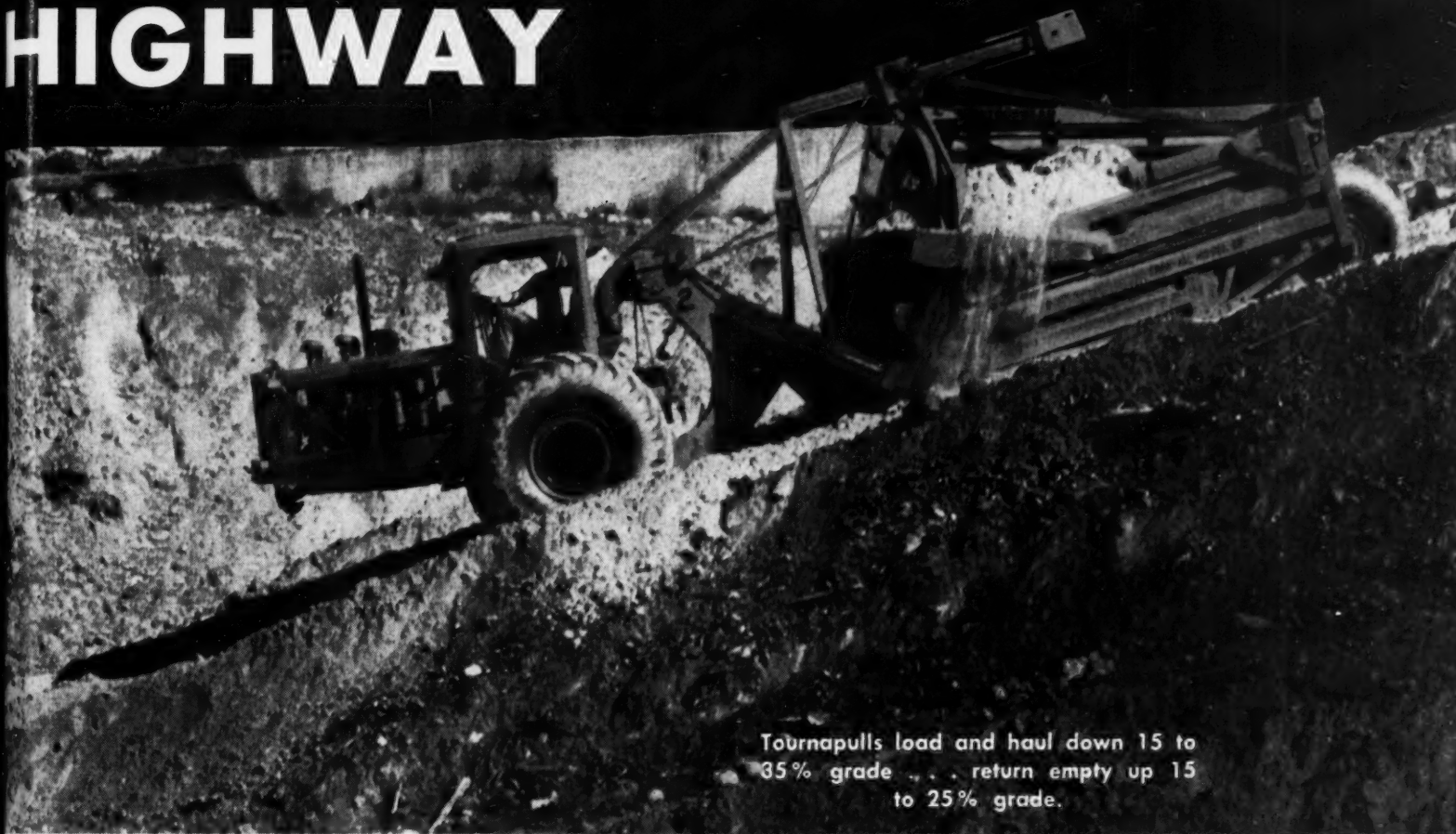
Narrow quarters...poor traction materials

Steep narrow cuts make maneuvering, passing and turning difficult . . . traction in loose fine material is poor, making grades even tougher. On other sections, job requirements call for 1000' of haul over existing paved highway. In spite of these varying conditions, Tournapulls keep up steady, high-speed production. Two-wheel prime mover design, correct ratio of weight to horsepower, big rubber tires give Tournapulls the flexibility needed for lowest-net-cost-per-yard earthmoving under all these conditions.

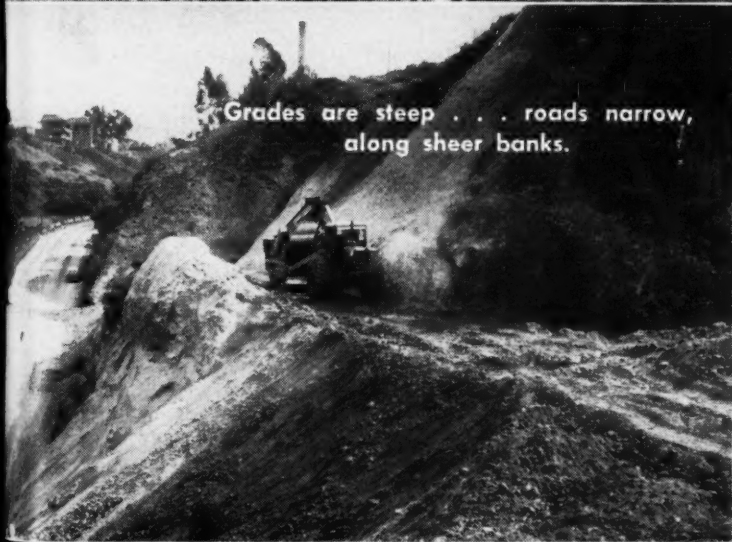
Insure your future dirtmoving profits with Tournapulls. Ask your LeTourneau Distributor for job-proved facts and figures on what Tournapulls can do in all types of materials, on long or short hauls, bad weather and tough job conditions.

FOR LOWEST NET COST PER YARD

Over grades to 35 percent HIGHWAY



Tournapulls load and haul down 15 to 35% grade . . . return empty up 15 to 25% grade.



Grades are steep . . . roads narrow, along sheer banks.



Even spread of Tournapull builds level grade on 30' fill at bottom of canyon.

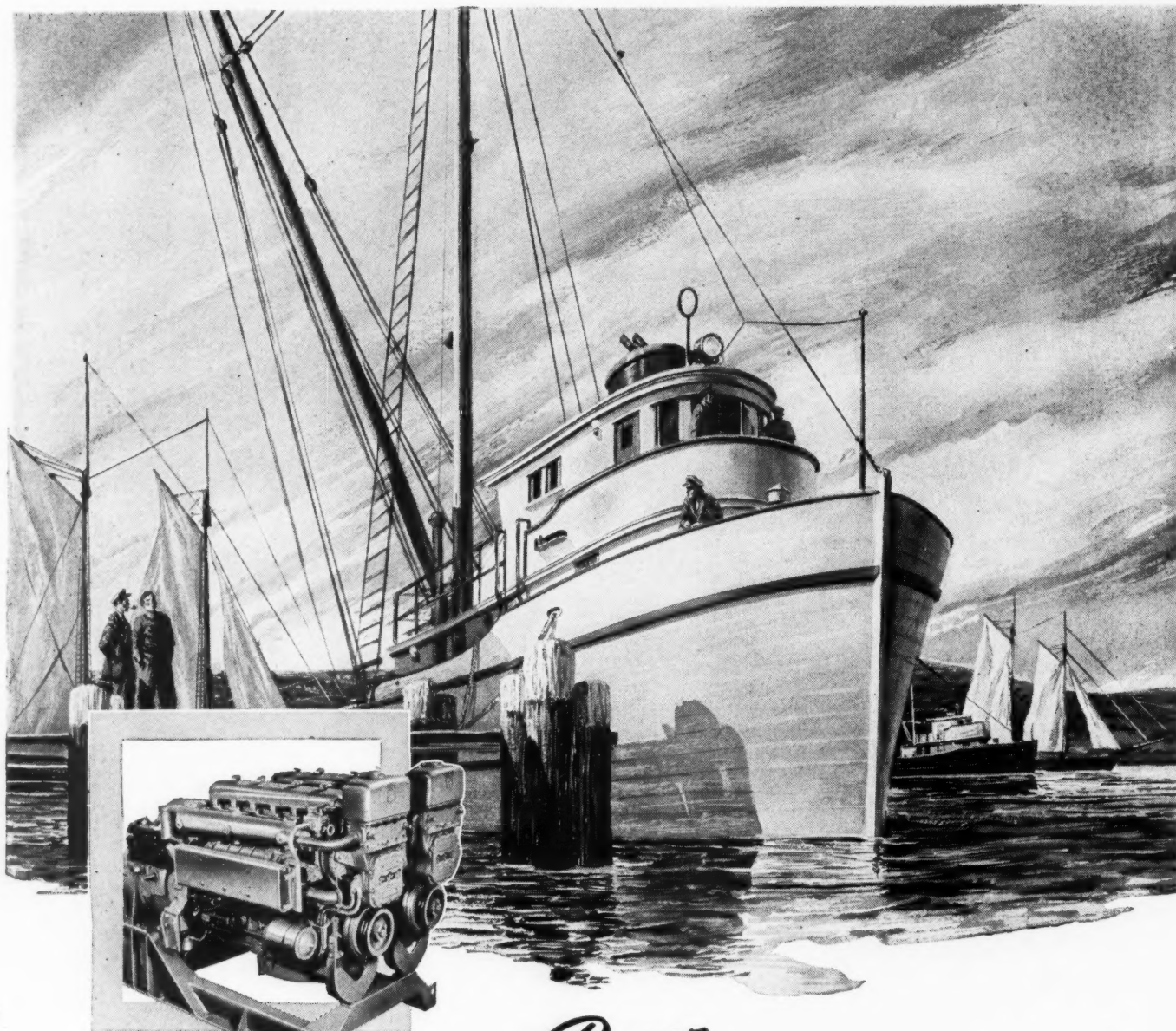


LETOURNEAU
PEORIA, ILLINOIS



TOURNAPULLS

Trade Mark Reg. U. S. Pat. Off.



For Great Diesel Power —set your course by the fisherman

FISHERMEN make their money by getting back fast with the most fish and at the least cost. There's no profit in hauling around big, heavy engines that take up a lot of room.

So every day sees more and more General Motors Diesels going into fishing boats. And for good sound reasons.

These Diesels pack more power in less space—weigh less than older types. So GM-powered boats carry more fish.

GM Diesels get efficient combustion from low-cost fuel—keep going day after day with the least maintenance.

Add these features to the re-

duced fire hazard, easy starting, quick availability of parts and service, and you see that GM Diesels have features that are valuable everywhere power is needed. That is why they're taking over so many jobs that Diesels never handled before.

Whatever needs for power you may have in road-making machinery, cranes, shovels or any other construction equipment—look to GM Diesels.



Features of GM Diesels Important to Every User of Power

- QUICK TO START**—on their own fuel
- LOW COST**—run on common fuel oil
- EASY TO MAINTAIN**—clean design plus accessibility
- LESS FIRE HAZARD**—no volatile explosive fuel
- COMPACT**—readily adaptable to any installation
- SMOOTH OPERATION**—rotating and reciprocating forces completely balanced
- QUICK ACCELERATION**—2-cycle principle produces power with every downward piston stroke

DETROIT DIESEL ENGINE DIVISION

DETROIT 23, MICH. •

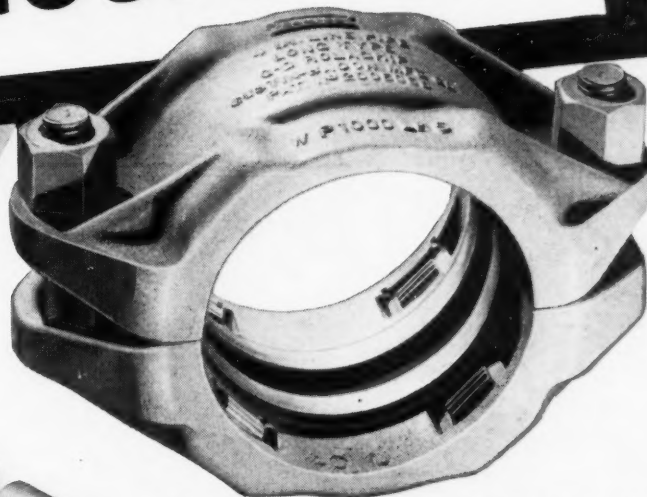
GENERAL MOTORS

SINGLE ENGINES... Up to 200 H.P.
MULTIPLE UNITS... Up to 800 H.P.

4

Reasons for Specifying . . .

ROLAGRIP PIPE COUPLINGS



For Plain End Pipe

Simple

Speedy

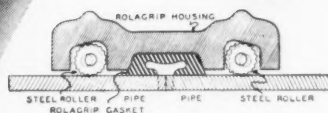
Secure

ROLAGRIPS afford savings in both installation and maintenance because no threading, grooving, flanging or welding is required.

No special tools or skills are required to make a leakproof connection. A ROLAGRIP Pipe coupling is made up of only a gasket, 2 housing halves, and the 2 bolts which hold them together.

ROLAGRIPS provide a quick, labor-saving connection. The gasket is simply slid over the joint and the halves of the housing bolted together.

ROLAGRIPS allow for normal expansion and contraction and permit maximum angular deflection. Fitted within recesses in the housing are special toothed steel rollers that embed into the surface of the pipe and the coupling housing with an ever tightening grip as the pipe tends to separate.



Surface or Buried—Permanent or Temporary ROLAGRIPS Save Time and Money

Wherever fuel, water or air must be carried in pipes . . . where flexibility for contraction, expansion, angular misalignment or vibration is necessary . . . where 100% reclaimability of both pipe and coupling is desired—the line can be more speedily and economically laid with ROLAGRIP Pipe Couplings.

Specify ROLAGRIP—the Coupling for Plain End Pipe



Established 1898

GUSTIN-BACON MANUFACTURING CO.

KANSAS CITY 7, MO.

NEW YORK

CHICAGO

PHILADELPHIA

HOUSTON

SAN FRANCISCO

TULSA

FORT WORTH

A complete package!

NEW LORAIN TL-20 COMES TO YOUR JOB READY FOR WORK

Choose your mounting and type of boom equipment and that does it! The TL-20, as a standard unit, comes to you with all the so-called "extras" built in, plus a lot more premium features never before offered by a machine in the ½-yd. class.

Check these features, then inspect a TL-20 at your nearest Thew-Lorain distributor. You'll find it a "complete package" full of many profitable surprises.

The Thew Shovel Company
LORAIN, OHIO

FIRST WITH THE FEATURES THAT COUNT

No Extras—all essential and desirable accessories (starter, generator, lights, etc.) are built as standard into every unit.

Unit Assembly—each major component (clutch shaft, engine, etc.) can be removed and interchanged as a complete unit.

2-Speed Crawler—2 speeds, standard equipment, available in both directions. Chain driven. Oil enclosed propelling mechanism.

Rubber-Tire Mountings—choice of nine mountings (Moto-Crane and Self-Propelled types) on 4 or 6 wheel units with or without front wheel drive.

5 Interchangeable Booms—available with interchangeable boom assemblies for shovel, crane, dragline, clamshell and hoe operation.

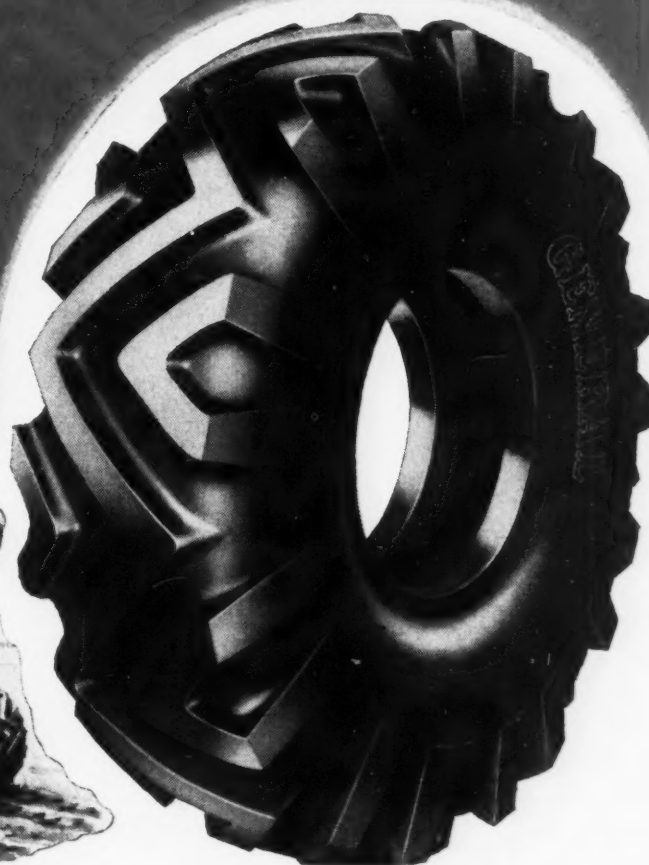
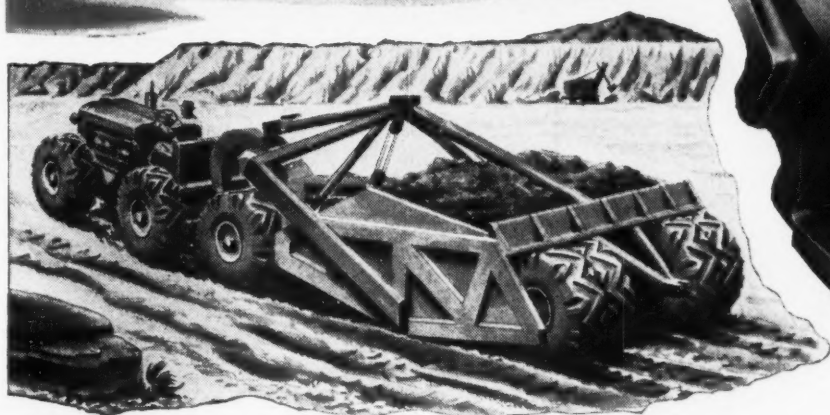
One-Piece Bed—turntable bed consists of a one-piece, all-welded, all-steel unit, which revolves on four Hook Rollers.



The
NEW Lorain

TL-20

THE GENERAL DEEP CLEAT



The Quality-Built Contractor's Tire that Makes Payloads Pay!

Like a boxer "rolls" with the blow . . . General's Shock-Absorber construction *absorbs* the shocks and impacts of punishing service . . . avoids the service damages that commonly cause tire failures.

This exclusive construction principle of General Off-the-Road Tires *distributes* shock loads and stresses uniformly throughout the tire carcass . . . stops damaging concentrations . . . offsets the common causes of bruising . . . snagging . . . tearing and blow-outs.

Built throughout to General's famous Top Quality, General's shock-absorber constructed Off-the-Road Tires provide a new standard of long, continuous service and economy to heavy contractors.

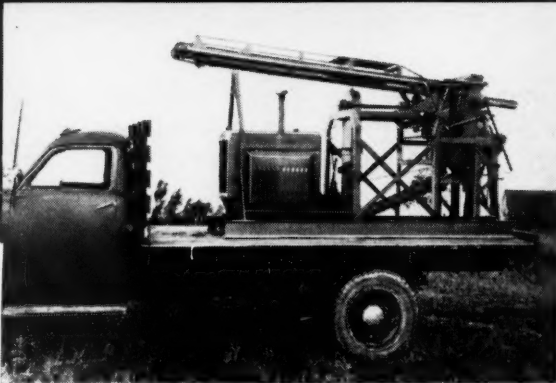
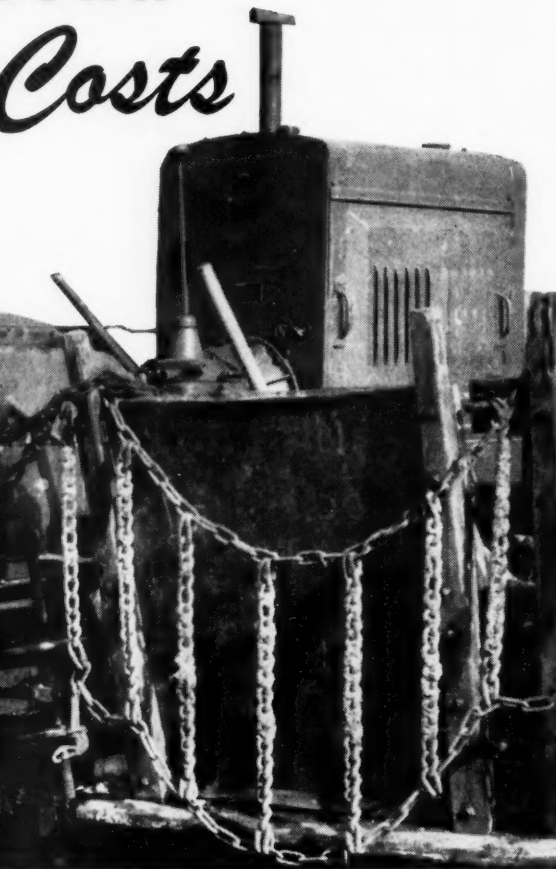


ROCK
SPECIAL



THE GENERAL TIRE & RUBBER CO. • AKRON, OHIO

DRIVING *Hole* DOWN *Costs* *with* **BUDA EARTH DRILLS**



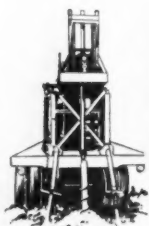
THE versatile Buda Earth Drill is helping to cut construction costs on scores of jobs all over the country . . . drilling varied diameter holes for pre-fabricated house foundations—guard rail posts—pre-boring for piles—fence posts, and practically every other job where fast, low-cost drilling is a prime requisite. The Model HBD shown above, for example, is rushing through a large fence post job in Chicago. Note that drill is side-mounted on the truck for convenience in moving between holes. Get complete information from your nearest distributor, or write us.

FASTER — PORTABLE

Above: Model HBH Deep Hole Earth Drill, for smaller diameter holes up to 100 ft. in depth. Unsurpassed for soil testing and prospecting.

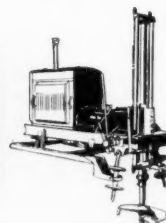
Write for literature

Buda HBH Deep Hole Drill, for smaller diameter holes up to 100' deep. Tops for soil testing — prospecting.



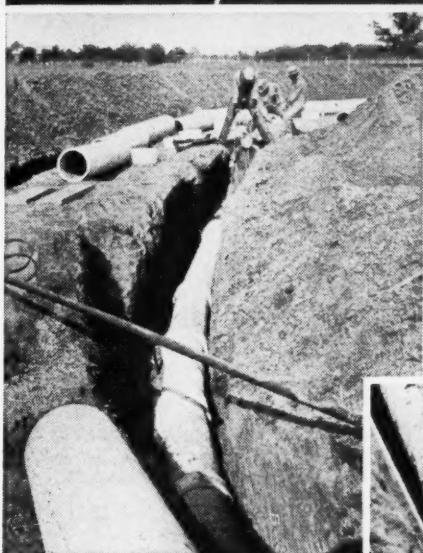
BUDA

15430 Commercial Avenue
HARVEY (Chicago Suburb) ILLINOIS



Buda Model HBD Earth Drill. Rigid head. Designed and built for a wide range of construction work.

This modern water pipe gives you **SPEED ON THE JOB**



ON CURVES and in hilly ground, too, Transite makes your job easier. Its flexible Simplex Couplings permit up to 5° deflection at each joint without the use of special fittings.



IN THE TRENCH, Transite's Simplex Coupling—the "packaged" joint that's made at the factory and assembled on the job—saves man hours. Furthermore, each joint can be checked for proper assembly as the pipe is laid—advance assurance that the line will meet final test requirements.

HERE'S ONE WATER PIPE you can count on for easier handling . . . faster installation.

Step by step, from unloading through assembly to final testing . . . this modern asbestos-cement pipe cuts man-hours and saves man-power. All but the larger sizes can be handled without mechanical equipment. The Simplex Coupling reduces assembly time . . . assures tight, yet flexible joints . . . permits narrower trenches with minimum disturbance to pavement.

And when the job is done, Transite's uniform strength, high-flow capacity unaffected by tuberculation, and proved resistance to corrosion all add up to efficient, economical performance through the years.

For complete information, send for Brochure TR-11A. Address Johns-Manville, Box 290, New York 16, New York.



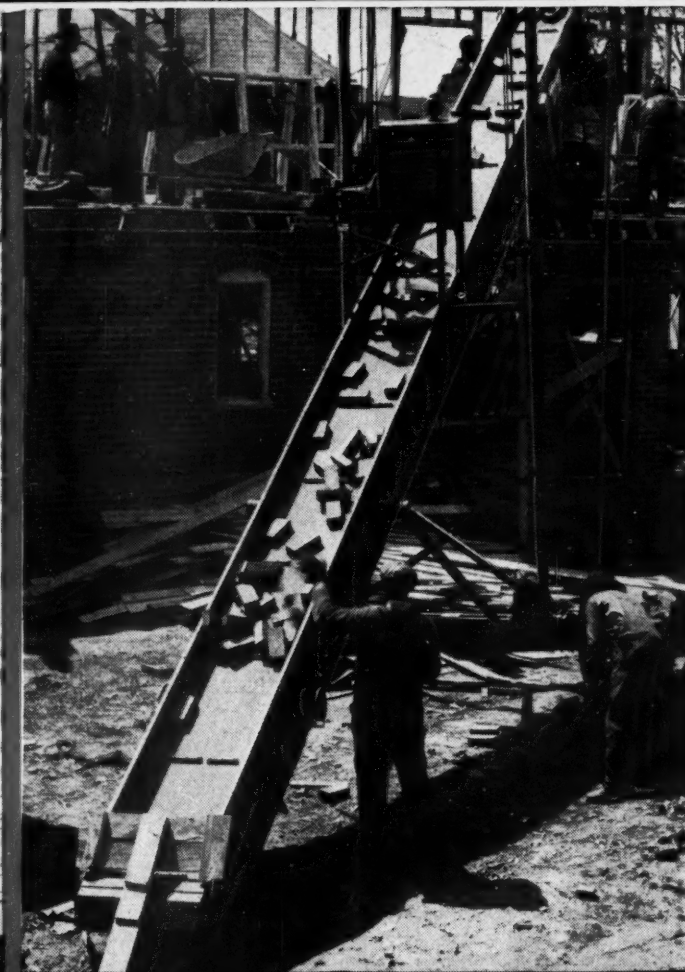
Johns-Manville **TRANSITE PRESSURE PIPE**

An Asbestos Product

Thermoid —Key to Progress in Many American Industries



The old method of getting bricks to the bricklayers has been superseded by the modern Thermoid Conveyor Belt



Here's the modern method. This Thermoid Belt was chosen because neither weather nor the sharp bricks will injure the belt.

SINCE 1880, Thermoid has contributed to the progress of American Industry. In many fields of business Thermoid Products play an indispensable part. For instance, the George Haiss Manufacturing Company, manufacturers of portable conveying equipment, chose Thermoid Conveyor Belting for the portable brick conveyor shown above.

The Thermoid Line* is the result of 65 years of research and experience that not only has kept pace with the demands of industry, but in many cases anticipated industry's needs.

The Thermoid Line* of belting and hose for materials handling and power transmission may contain the key to another step forward in the improvement of your process and the reduction of your costs.—"It's Good Business to Do Business With Thermoid."

***THE THERMOID LINE INCLUDES:** Transmission Belting • F.H.P. and Multiple V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Sheet Packings • Industrial Brake Linings and Friction Products • Molded Hard Rubber and Plastic Products.

Thermoid Rubber

DIVISION OF THERMOID COMPANY

302 WHITEHEAD ROAD
TRENTON 4, NEW JERSEY

Contributor to Industrial Advancement Since 1880

Down-to-Earth Engineering

**GAR WOOD Cable Controls Feature
Rugged Simplicity and Direct Action Pull**



Cable Dozercaster

The cable goes direct to the job in GAR WOOD Cable-Controlled Road Machinery. As a result, it has fast action, positively controlled.



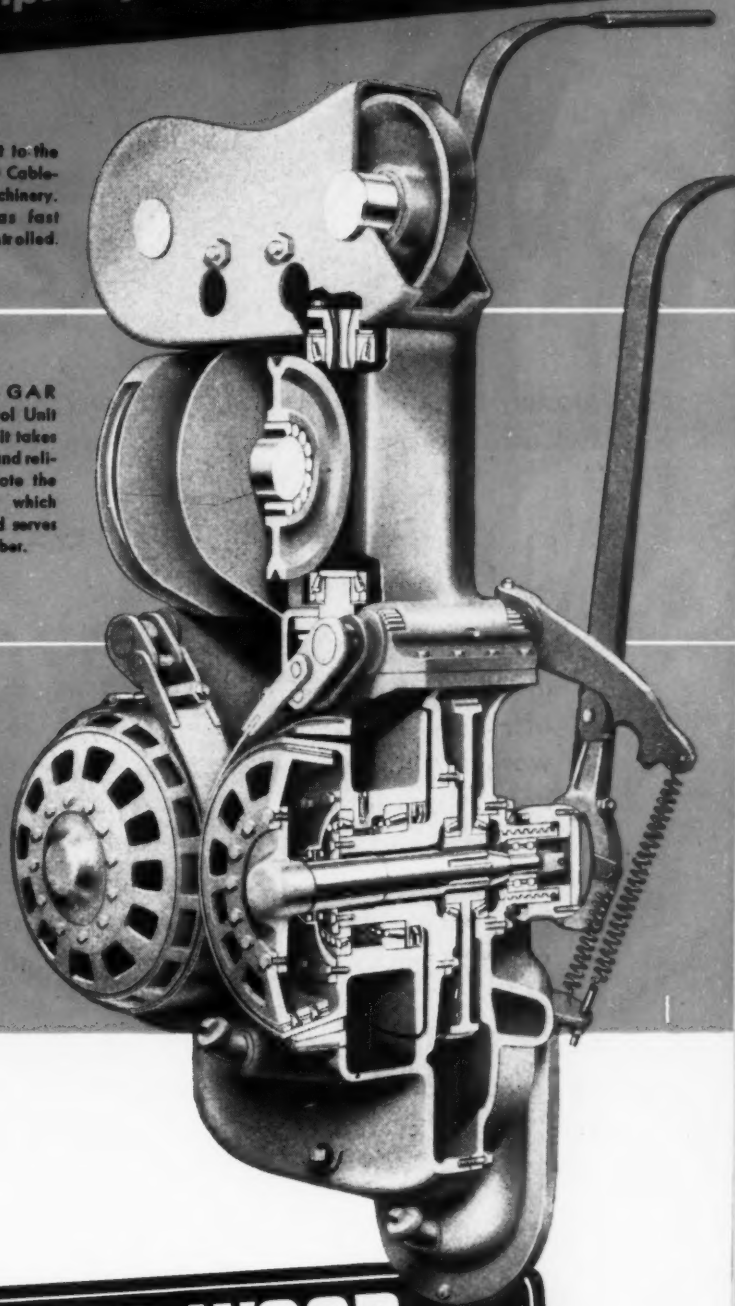
Heavy-Duty Cable Ripper

The Job-proved GAR WOOD Cable Control Unit (right) has everything it takes for smooth operation and reliable performance. Note the sturdy steel housing which prevents distortion and serves as a lubrication chamber.



4-Wheel Cable Scraper

Outside clutches and servo-type, self-energizing brakes cool themselves and are readily accessible. Roller bearings throughout and spur-type gears keep adjustments at a minimum.



PROVED through the years on the toughest of jobs. Made more rugged than ever by the lessons learned in war action on every front, from Guadalcanal to Okinawa and from Oran to Berlin.

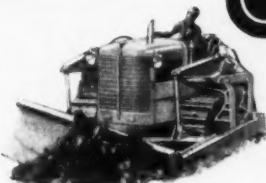
GAR WOOD Road Machinery and the famous GAR WOOD Cable Control Power Unit offers practical design and sound construction, well engineered and honestly built—equipment that *holds together* and can be operated with an absolute minimum of down time. *If it's GAR WOOD, it's good.*

See your Allis-Chalmers dealer. He'll be happy to give you all the facts and show you Gar Wood Earth Moving Equipment *on the job* in your own vicinity.

**GAR WOOD
ROAD MACHINERY**
WITH ALLIS-CHALMERS DIESEL POWER



Gar Wood 2-Wheel Hydraulic Scraper and Bulldozer



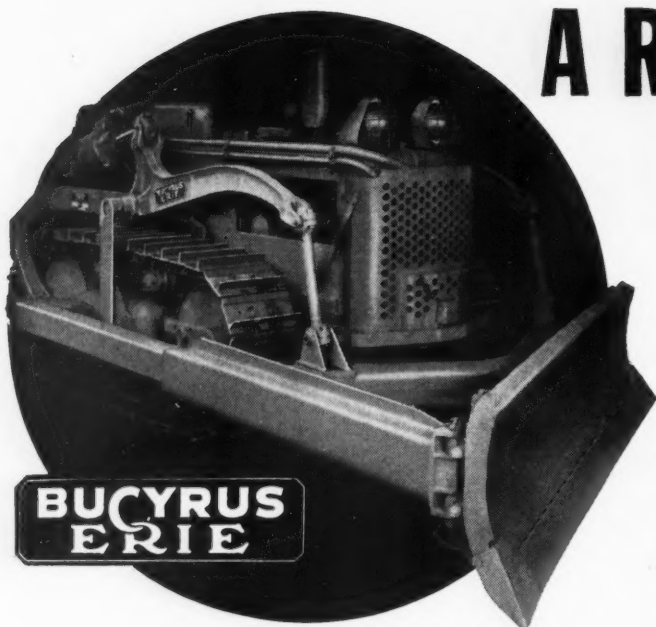
Gar Wood Hydraulic Dozercaster

OTHER GAR WOOD PRODUCTS: HOISTS AND BODIES • TANKS • WINCHES AND CRANES • HEATING EQUIPMENT • MOTOR BOATS



Sold Through
ALLIS-CHALMERS
Dealers Everywhere

ROAD MACHINERY DIVISION
GAR WOOD INDUSTRIES, INC.
DETROIT 11, MICHIGAN



A REAL DIGGING TOOL THAT'S EASY ON THE TRACTOR

Bucyrus-Erie Bullgrader-International TracTracTor combinations are powerful, economical dirt-moving teams—powerful because the Bullgrader applies the power of this tractor most efficiently; economical because the Bullgrader safeguards the tractor from undue wear and maintenance. Here are the specific reasons why every Bull-

grader, designed and built exclusively for International TracTracTors, permits its owner to take full advantage of tractor power; here are reasons, too, why maintenance is so low:

1 ORIGINAL TRACTOR BALANCE IS MAINTAINED

The Bullgrader is mounted to the TracTracTor in such a way that its balance point is not affected. This enables the tractor to do the work for which it is designed, lets it travel both forward and backward without tipping. It means that you get the full tractive effort of the track belt. Track roller loads are distributed evenly. Excessive wear and strain on front track idlers and rollers is eliminated.

2 LOADS ARE APPLIED AT THE PLACES DESIGNED TO TAKE THEM

The main frame of the Bullgrader is attached to the tractor at the point of rotation of the tractor tracks, so that digging thrusts are carried directly to pivots on the rear support brackets. All superstructures are mounted on the track frame, relieving the tractor main frame, engine, transmission case, final drive housing, etc., of damaging stress and shock loads.

Let your International TracTracTor Distributor show you these features. Be sure to ask him about other Bullgrader features, too: hydraulic control that gives you positive digging down pressure, scientifically curved blade, quick angling and tilting, unobstructed vision.

13745

BUCYRUS-ERIE COMPANY SO. MILWAUKEE WISCONSIN



See Your
**INTERNATIONAL
TRACTRACTOR
DISTRIBUTOR**

On the small jobs too

YOU CAN MAKE MORE MONEY

with **MICHIGAN**

MOBILE SHOVEL-CRANES!



MODEL T-6-K
3/8 YD. SHOVEL
6 TON CRANE

3/8 YD. and 1/2 YD. SHOVELS

• 6 to 12 TON CRANES •

•

FULLY CONVERTIBLE

•

AIR-CONTROLLED CLUTCHES

•

ONE-MAN OPERATION

•

THERE'S real money for you in those smaller jobs! Especially when you take advantage of the truck mobility, operating speed and versatility of the famous MICHIGAN Mobile SHOVEL-CRANES. They consume little time traveling from job to job — in fact, they get there almost as soon as an ordinary truck. On the job, their Fingertip Air Controlled Clutches enable operators to finish the work in a hurry. And when change of attachments is necessary, conversion can be made with a minimum of effort, in a couple of hours . . .

It will pay you to find out about the advantages of MICHIGAN Mobile SHOVEL-CRANES and how they can boost your income by keeping profitably busy *all* the time — on small jobs as well as large! Write today for complete information on these money-making shovel-cranes — ask for Bulletin CM 86.

MICHIGAN

POWER SHOVEL COMPANY

BENTON HARBOR MICHIGAN



A "flying" project from the start! Four A-C torque converter tractors really make the dirt fly on this million yd. airport project at Greenbelt, Md. Owner F. W. Schrom also speeds maintenance and finishing with an Allis-Chalmers Model A-D Motor Grader.

Left: Torque converters plus pusher loading...this is the way to really move dirt! Owner Schrom assures himself of fastest possible loading and hauling, capacity loads every trip, with this combination.

Allis-Chalmers TORQUE CONVERTER Boosts Tractor Output

The Allis-Chalmers torque converter method of transmitting tractor engine power livens up tractor performance — gets much more work done.

With a torque converter, highest possible speeds at which load can be moved are automatically selected in each of the three forward and reverse speed ranges. This gives you infinite working speeds in each gear — from zero to maximum. Assures peak tractor performance at all times. Keeps gear shifting to an absolute minimum.

There's no restarting, either. Engine

cannot be stalled!

Operation is continuously smooth. Cushion of oil between engine and tractor train protects tractor and auxiliary equipment from shock and abuse. There's more time on the job . . . less money spent on repairs, overhaul!

Operators go for it, too! Smooth, easy operation, less gear shifting, means less fatigue — more work done!

Yes . . . moving dirt with torque converter tractors is a new construction experience . . . worth your immediate investigation.

Yes... Much More Work Done



ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



LARGEST *All Welded* *High Pressure Gas Holders*

SOUTHWEST WELDING & MANUFACTURING COMPANY field erected four High Pressure GAS HOLDERS, 34' in diameter x 205' overall in length, totaling 2,000,000 cubic foot capacity, under sub-contract to Bethlehem Steel Company, for the City of Long Beach, California.

These huge GAS HOLDERS were completely fabricated from A-212 Grade B Fire-box Plate, and constructed to withstand an operating pressure of 55 pounds PSI. To insure quality in field-welding, all seams were Magnafluxed, and upon completion, GAS HOLDERS were subjected to a 60.5 pound PSI air test. Approximately 1,500 tons of steel were required in the erection of the four GAS HOLDERS.




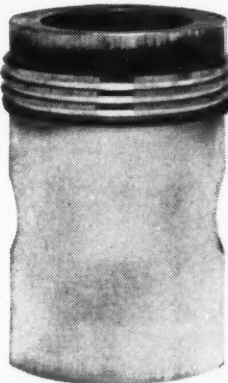
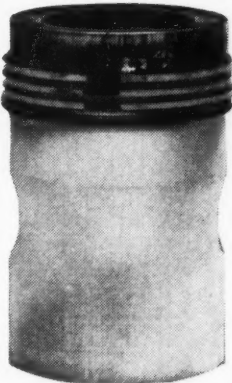




SOUTHWEST'S efficient engineering personnel, supervision and field crews are your assurance of receiving good workmanship on any type of steel construction, including pressure holders, penstocks, syphons, caissons, field storage tanks of any size, capacity or location.

Consult us on your future requirements



Southwest Welding & Manufacturing Co. *Alhambra, California*

There's a difference in heavy duty oils.

STANOLUBE HD	ACCEPTABLE HEAVY DUTY OIL	UNACCEPTABLE HEAVY DUTY OIL
A 		
B 		
C 		

MANY OILS pass the tests set up by Army Specification 2-104B to determine an oil's suitability for use in Diesel engines or gasoline engines in heavy duty service. But that does not mean that all of these HD (heavy duty) oils are the same.

The pistons shown are from three of the tests: A. The accelerated 36-hour Chevrolet engine stability and bearing corrosion test. B. The 480-hour Caterpillar Diesel engine endurance test. C. The 500-hour G.M. Series 71 Diesel engine test. In each of these tests Stanolube HD leaves pistons clean and rings free.

Details of all tests which motor oils must pass to meet Specification 2-104B are given in the booklet below. Other facts in this booklet will help you to evaluate heavy duty oil quality in selecting the best oil for your fleet.

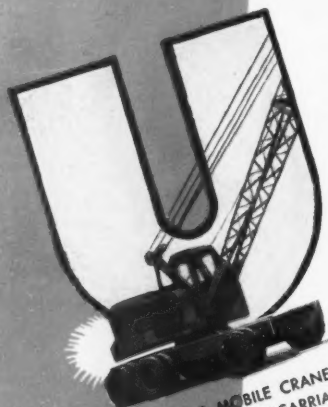
Send for a Copy



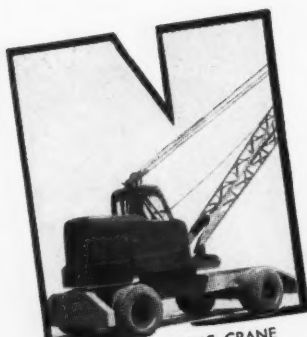
Write to Standard Oil Company (Indiana),
910 S. Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA)

**STANDARD
SERVICE**



UNIT 1020 MOBILE CRANE
WITH 3 AXLE UNDERCARRIAGE
10 TON CAPACITY



UNIT 1020 MOBILE CRANE
WITH 2 AXLE UNDERCARRIAGE
10 TON CAPACITY



UNIT 357 MOBILE CRANE
WITH 2 AXLE UNDERCARRIAGE
5 TON CAPACITY

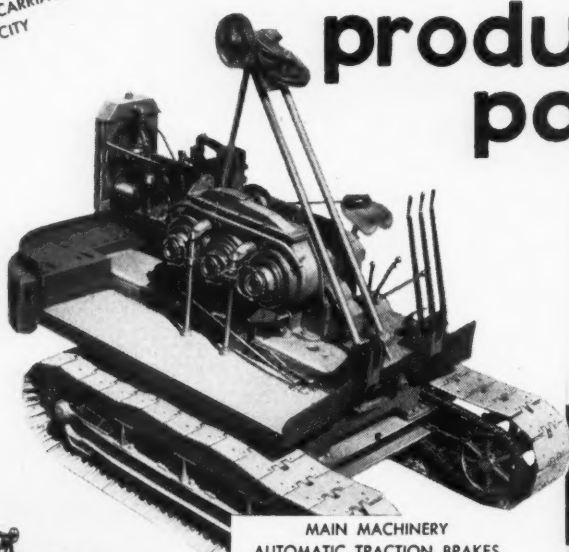


UNIT 1020 TRUCK CRANE
MOUNTED ON 3 AXLE TRUCK
10 TON CAPACITY

production parade

**½ AND ¾ YD.
EXCAVATORS**

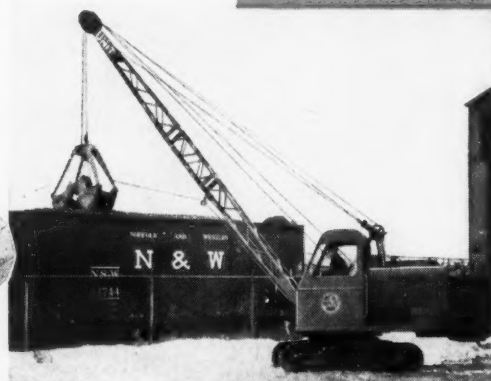
5 TO 10 TON CRANES



MAIN MACHINERY
AUTOMATIC TRACTION BRAKES
STRAIGHT LINE ENGINE MOUNTING
ONE PIECE CAST GEAR CASE



UNIT 1020 . . . ¾ YD.
TRENCHER



UNIT 514 . . . ½ YD.
CLAMSHELL

**CONTACT
FACTORY
DIRECT
FOR PRICE
AND DELIVERY**

Full-Vision Cab . . . ENABLES
OPERATOR TO SEE IN ALL DIRECTIONS

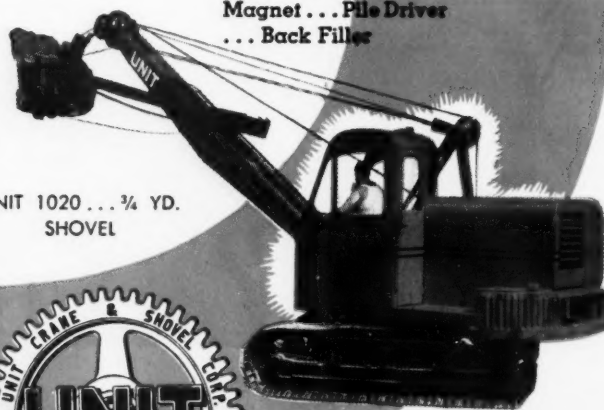
*Convertible TO ALL
ATTACHMENTS*

Shovel . . . Clamshell
Dragline . . . Trencher
Magnet . . . Pile Driver
. . . Back Filler



UNIT 514 . . . ½ YD.
DRAGLINE

UNIT 1020 . . . ¾ YD.
SHOVEL



UNIT CRANE & SHOVEL CORP.

Address: 6305 W. Burnham St., Milwaukee 14, Wis.



MILWAUKEE 14,
WISCONSIN, U.S.A.

A 5005-1P-C-U

LESS LINKAGE* MORE YARDAGE

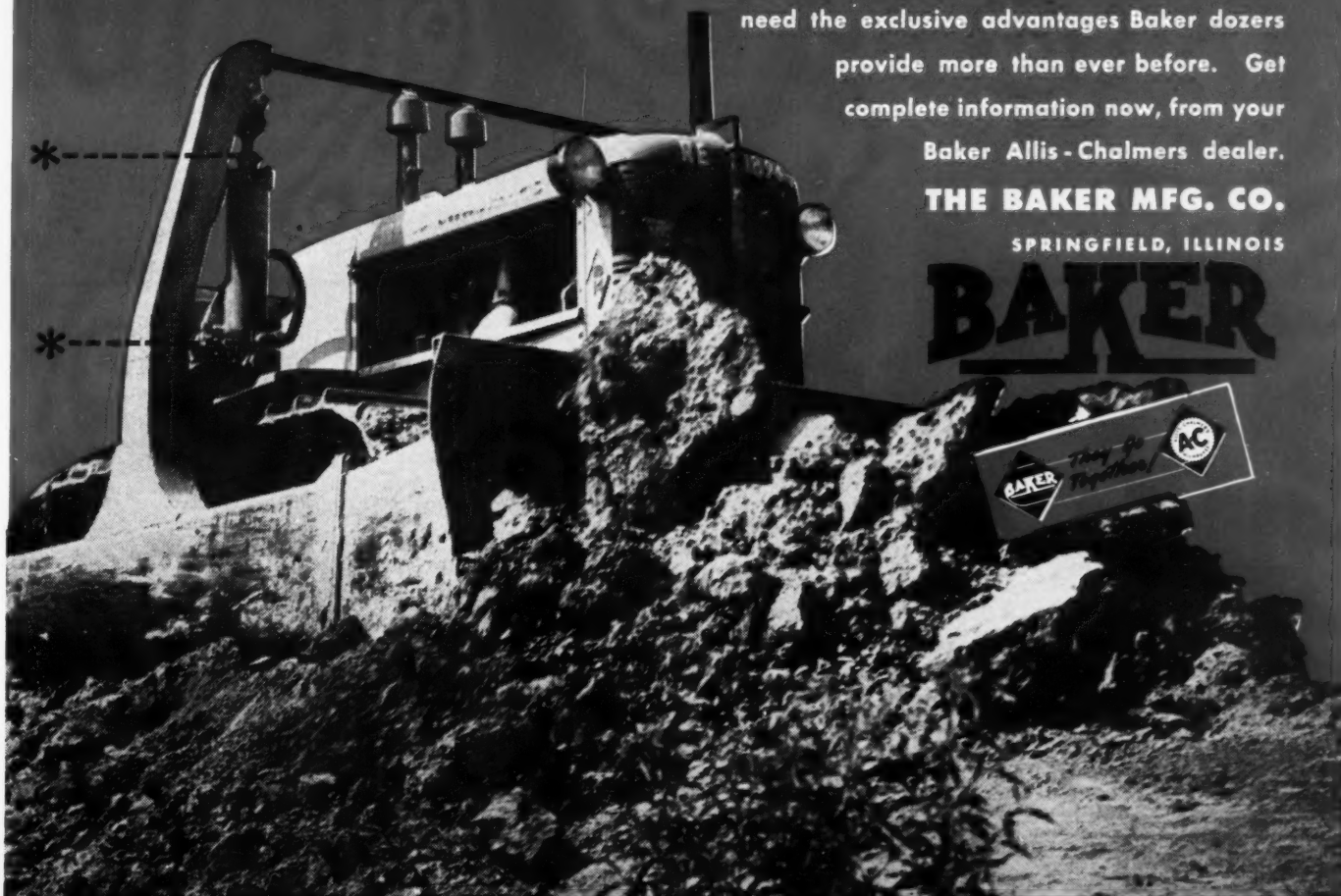
Baker simplified, direct-lift bulldozers mean extra yardage on any job. The elimination of complicated linkage assures fast, positive, accurate control of the blade, plus life-long rigidity. Fewer connections also mean fewer points of wear — less maintenance — less down time — maximum yardage per shift. Now, when time is important, when huge yardages must be moved, you

need the exclusive advantages Baker dozers provide more than ever before. Get complete information now, from your Baker Allis-Chalmers dealer.

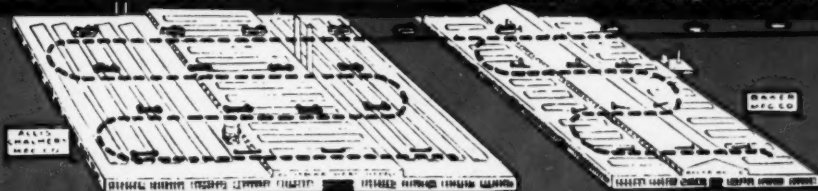
THE BAKER MFG. CO.

SPRINGFIELD, ILLINOIS

BAKER



"STRAIGHT THROUGH" ASSEMBLY LINE — ALLIS-CHALMERS TO BAKER TO YOU!



The modern Baker plant with its completely equipped fabricating, machining and blacksmithing shops adjoins the Allis-Chalmers crawler tractor plant. When you order an A-C tractor with Baker bulldozer or gradebuilder, your tractor leaves the A-C assembly line, crosses a narrow court and goes on the Baker final assembly line.

Fits the Job Like
Custom-Made Clothes

ATLAS ROCKMASTER

a whole new
System of Blasting



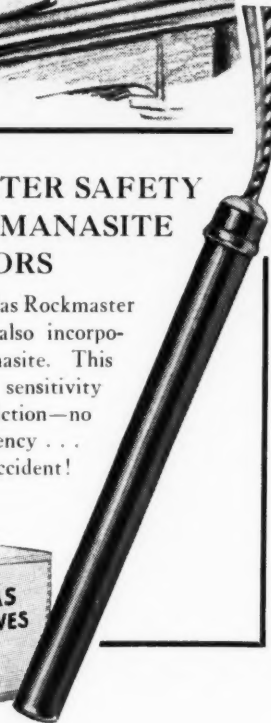
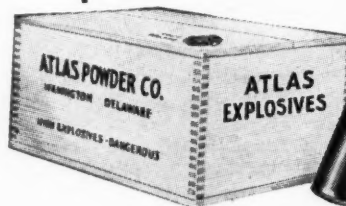
The first major blasting development since the war, Atlas Rockmaster has stepped up production enormously in hundreds of operations. It has increased fragmentation, cut down complaints about noise and vibration, reduced the problem of backbreak in operation after operation—quarrying, mining, construction.

Why? Because Atlas Rockmaster is a blasting system—not just a device—and it's "made-to-measure" for each particular job. Based on an entirely new development of the delayed-action principle, it takes into account drilling, type of explosive, and timing of detonation. Each of these factors must be right for each job. In short, a Rockmaster blast is custom-made to fit requirements.

Not the least factor in Rockmaster's success is Atlas experience with explosives. This "know-how" is yours for the asking *now* in determining what Rockmaster can do for you. Will it cut down your costs, increase your production, as it has for so many others? With your knowledge of the job, and our knowledge of explosives, the answer is probably yes. In any case, we can soon find out. Call in the Atlas Representative!

THE GREATER SAFETY OF ATLAS MANASITE DETONATORS

Remember, the Atlas Rockmaster Blasting System also incorporates Atlas Manasite. This means decreased sensitivity to impact and friction—no sacrifice of efficiency . . . less chance of accident!



"ROCKMASTER"—Trade Mark
Manasite: Reg. U. S. Pat. Off.

ATLAS

EXPLOSIVES
"Everything for Blasting"



ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in principal cities • Cable Address—Atpowco

"110 TONS"

IN LESS THAN 54 MINUTES

—CRUSHING TO 5/8" WITH 75% CRUSHING"

From a report of an actual test run of a Cedarapids Junior Tandem made on the job by a well-known contractor. (Name on request.)

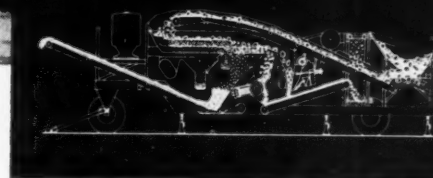


This may not be a record, but it's still darn good production with plenty of profit for the contractor. On some jobs, the Cedarapids Junior Tandem will turn out more tonnage and on others not as much because there are so many outside factors that affect production. However, on job after job, you can count on the Junior Tandem for higher capacity, easier operation, minimum maintenance and low cost.

Here are just a few of the reasons why: Horizontal vibrating screen assures greater capacity, closer grading and higher efficiency. 10" x 24" or 10" x 36" roller bearing jaw crusher and 24" x 16" roller bearing roll crusher provide plenty of crushing capacity for the toughest jobs. V-belts and universal drives eliminate troublesome chains and sprockets. Fast, easy set-up and take-down minimize lost time between jobs. Chip screen and sand eliminator can be used as desired. Choice of feeding methods to fit different loading conditions.

When buying a crushing plant—buy the best—buy Cedarapids. Get the details about the Junior Tandem from your nearest Cedarapids distributor. They're experts in solving aggregate producing and asphalt mixing problems.

IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA, U. S. A.



Cedarapids

Built by
IOWA

THE IOWA LINE

of Material Handling Equipment Includes
ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS—STEEL BINS • BUCKET ELEVATORS • VIBRATOR AND REVOLVING SCREENS • STRAIGHT LINE ROCK AND GRAVEL PLANTS • FEEDERS—TRAPS • PORTABLE POWER CONVEYORS • PORTABLE STONE PLANTS • PORTABLE GRAVEL PLANTS • REDUCTION CRUSHERS • BATCH TYPE ASPHALT PLANTS • TRAVELING (ROAD MIX) PLANTS • DRAG SCRAPER TANKS • WASHING PLANTS • TRACTOR-CRUSHER PLANTS • STEEL TRUCKS AND TRAILERS • KUBIT IMPACT BREAKERS

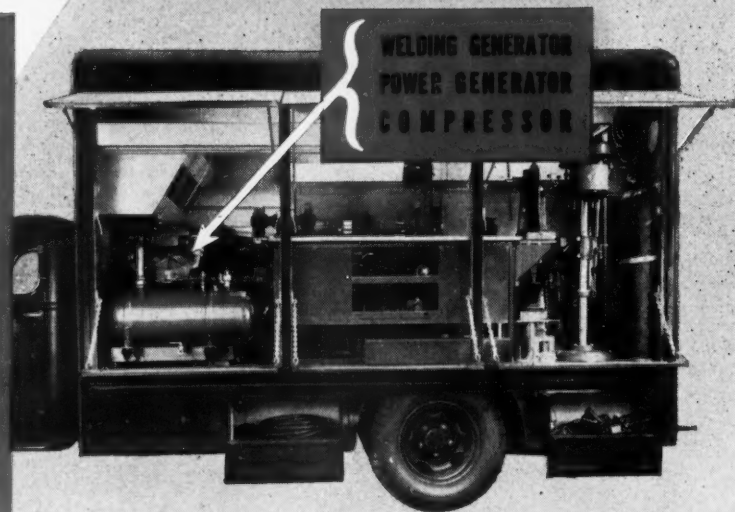
announcing

THE DAVEY MOBILE MACHINE SHOP

. . . now available—
on standard trucks
. . . all of the repair
and maintenance
equipment ordinarily
found only in large
central service shops.



With body sides closed, the Mobile Machine Shop appears like any other truck . . . gives no indication of the vast amount of equipment it contains.



The Davey Compressor Co., originator of Auto-Air compressors, is pleased to announce the production of a complete, fully-equipped repair depot "on wheels" . . . the Davey Mobile Machine Shop.

Mounted on standard long wheel base trucks, the shop equipment is assembled around three basic power units, driven direct from the truck engine through the Davey Heavy Duty Power Take-off.

- 60 c. f. m. Davey "Auto-Air" Compressor
- 300 Ampere Welding Generator
- 5 KW Power Generator.

Auxiliary accessories (provided in accordance with individual user requirements) are the same as those found in stationary shops.

For complete details on how the Mobile Machine Shop will eliminate the costly practice of hauling broken-down equipment to central depots for repairs . . . save you time, labor and money . . . write today for Booklet E-208.

In addition to Mobile Machine Shops and Auto-Airs, Davey builds a complete line of portable compressors.

P&P-106

DAVEY

There are Davey Dealers in Principal Cities

DAVEY COMPRESSOR CO.
KENT, OHIO



Model 60
Air Aristocrat

2

Reasons why...

ATHEY PD-10 TRAILERS WORK HERE!

► Here's another job — the Peerless Lime Company of Ste. Genevieve, Mo. — where operating features of the new Athey PD-10 Trailer were the perfect answer to a tough job condition.

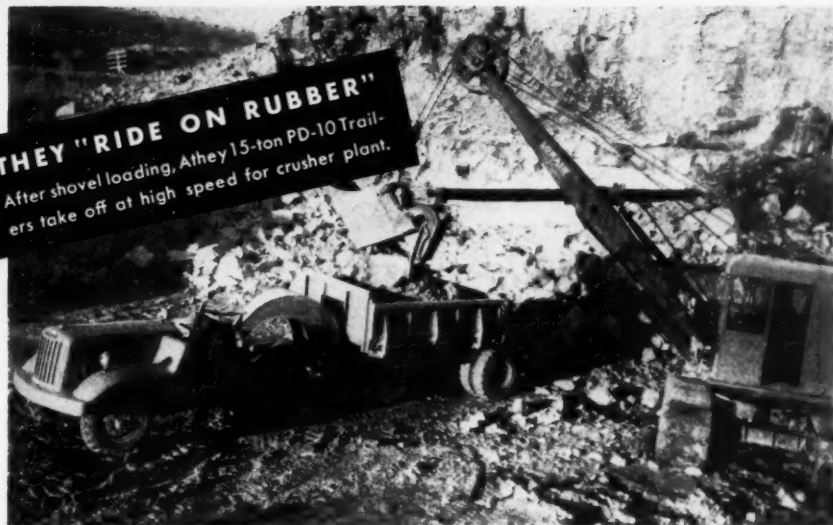
Operations at the huge quarry called for loading trailers both on the surface and in an underground "cave" cut in solid limestone. Haul distances to the crusher called for high-speed travel so that crushing plant would operate at maximum capacity. The new Athey PD-10 Trailer, powered by "Caterpillar" DW 10 rubber-tired Tractor, gave haul speeds up to 18 m.p.h. to speed delivery of material.

Unloading at crusher plant demanded a side-dump trailer due to location of hopper at mouth of cave and the design of the crusher setup. Athey PD-10 Trailer 2-way side dumping action again was the fast, low-cost answer for this material handling job.

ATHEY PRODUCTS CORPORATION • CHICAGO, ILL.

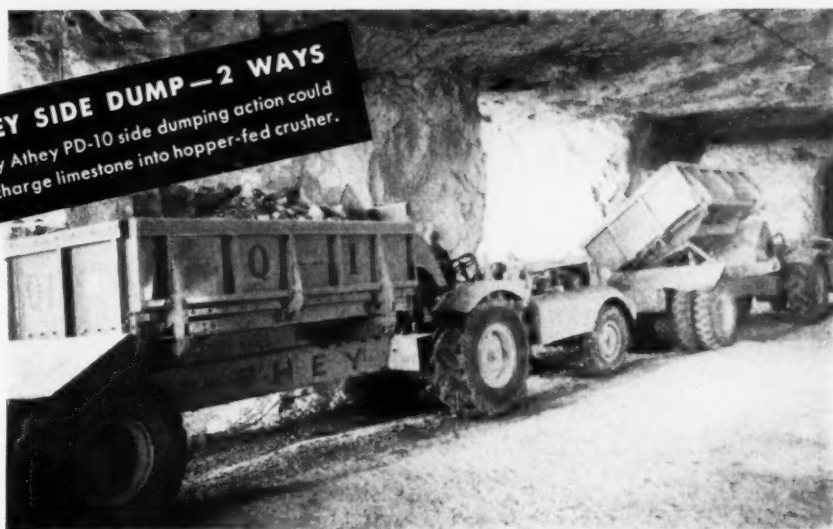
1

THEY "RIDE ON RUBBER"
After shovel loading, Athey 15-ton PD-10 Trailers take off at high speed for crusher plant.



2

THEY SIDE DUMP — 2 WAYS
Only Athey PD-10 side dumping action could discharge limestone into hopper-fed crusher.



For big capacity, fast travel and more output — plus the versatile unloading of 2-way side dump — ask your Athey-“Caterpillar” Dealer for facts about the new PD-10 Trailer . . . powered by the famous “Caterpillar” DW-10 Tractor. He will gladly assist you in the selection and application of the right combination for lowest cost operation.

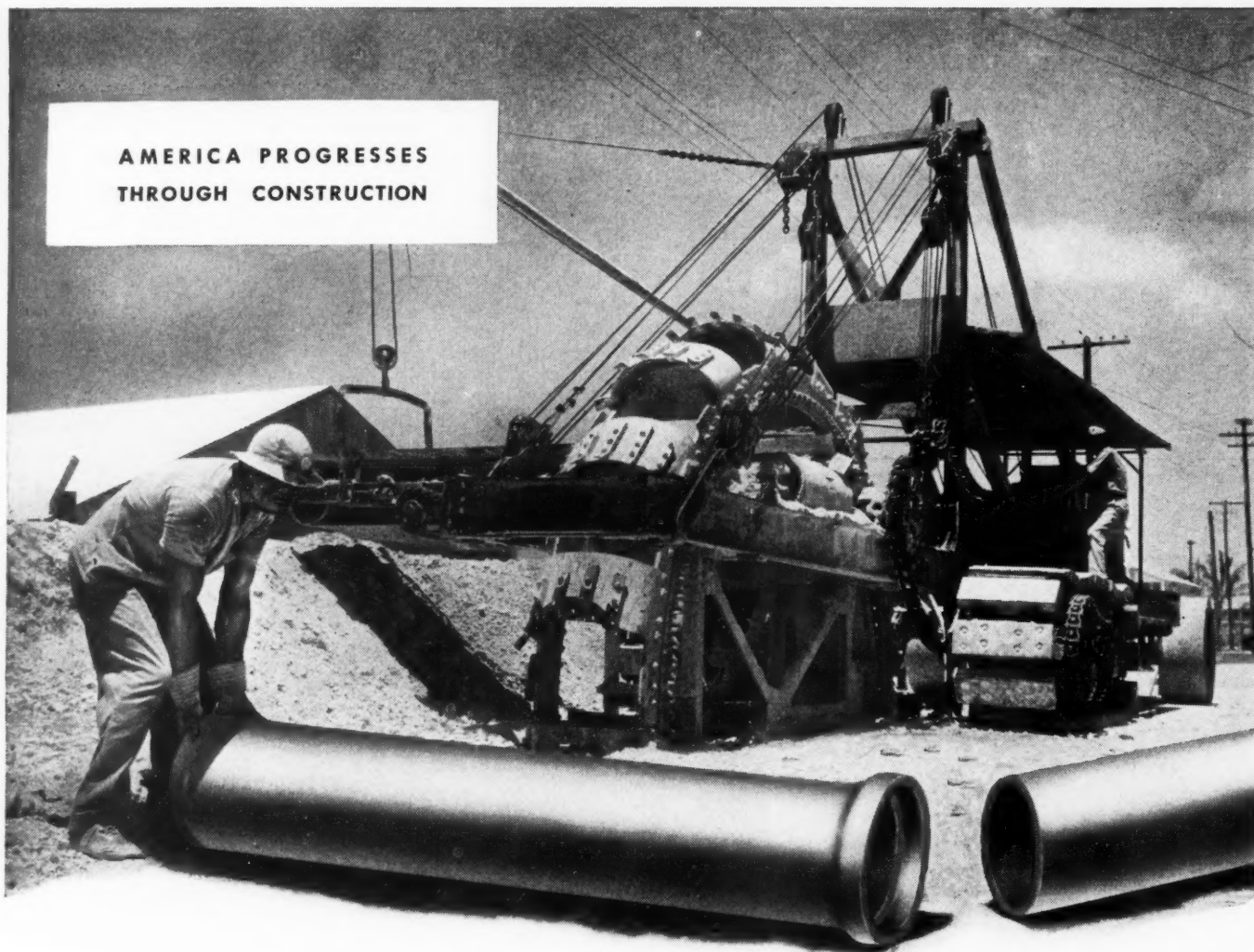


Athey



DEPENDABLE LOADING AND HAULING EQUIPMENT

AMERICA PROGRESSES
THROUGH CONSTRUCTION



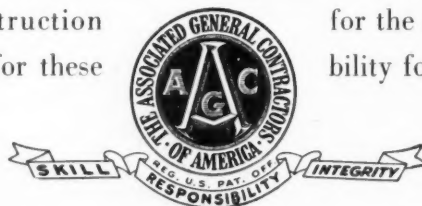
Adequate "Facilities For Living" Needed!

RIGHT NOW—just about every community needs expansions to its water and sewer systems—more streets and sidewalks, schools, hospitals, playgrounds, stores, fire stations, post offices, gas lines and other projects—as cities are extended and housing is built.

For each new house or apartment an additional \$2,000 in construction is needed, on the average, for these

municipal facilities. In the next few years the nation will need \$5,000,000,000 worth of this type of work.

For greatest efficiency and economy in the construction of these projects necessary for the growth of communities—to save time and money for the taxpayer—A.G.C. general contractors can be depended upon for the skill, integrity, and responsibility for which this emblem stands.



This advertisement is No. 7 of this series

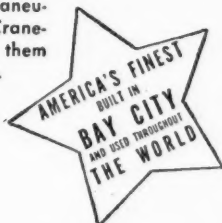
THE ASSOCIATED GENERAL CONTRACTORS of AMERICA, Inc.

More Than Ninety Branches and Chapters Throughout America
National Headquarters—Munsey Building, Washington 4, D. C.

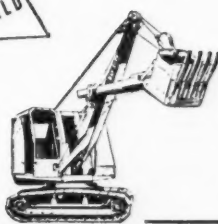
SKILL, INTEGRITY AND RESPONSIBILITY IN CONSTRUCTION OF BUILDINGS, HIGHWAYS, RAILROADS, AIRPORTS AND PUBLIC WORKS



Ruggedly built throughout, exceptionally maneuverable, and perfectly balanced, BAY CITY Crane-Mobile swings girders high and low—spots them accurately for fast, profitable steel erection.



BAY CITY



SHOVELS • DRAGLINES
CRANES • HOES • CLAMSHELLS

SEE YOUR NEAREST DEALER for Bay City excavating and material handling equipment in sizes from $\frac{3}{8}$ to $1\frac{1}{4}$ yards having crane rating up to 20 tons. Both crawler and pneumatic tire mounting.



1. Seven Diesel Tractors operating scrapers.



2. One Diesel Tractor bunching rock with rock rake.

ALL THE WAY WITH



4. Two Diesel Tractors grading levees.



5. Two Diesel Tractors bulldozing rock for rip-rap.

CATERPILLAR

REG. U.S. PAT. OFF.



3. One Diesel Engine powering shovel.

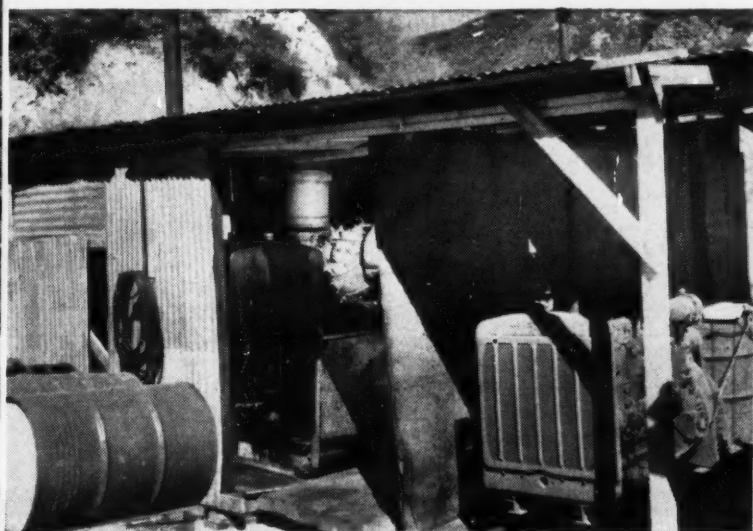


"CATERPILLAR" DIESELS

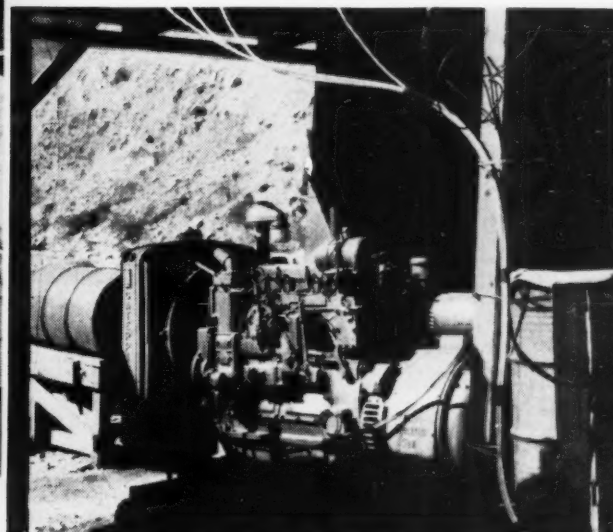
Keen, business-minded contractors don't risk repeated purchases of costly equipment that can't show evidence of long-lived performance and dependability. It is on that sound basis that the seven important phases of the Lytle Creek (California) Flood Control Project pictured here overwhelmingly featured "Caterpillar" Diesel equipment.

Note the number of units "zoned" to the various jobs.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS



6. Two Diesel Engines operating compressors.



7. One Diesel Electric Set supplying power for repair shop, quarry lights and gas pumps.

DIESEL

ENGINES • TRACTORS

MOTOR GRADERS • EARTHMOVING EQUIPMENT

—for lowest costs on earth

BEMIS "Dri-Tite" TARPAULINS...

Your Protection Against Material Losses

Reduce on-the-job losses of cement, lumber, tools, machinery, plaster, and other supplies and equipment by using Bemis Dri-Tite Tarpaulins.

"Dri-Tite" Tarpaulins are available in all standard sizes in various weights. They're real protection against rain, snow and sleet because of the Bemis "Dri-Tite" waterproofing process. They're excellent protection against sun, too. "Dri-Tite" Tarpaulins never suffer from "running" or softening in warm weather, never stiffen or crack in cold weather.

Write Bemis today for your 1946 schedule of prices.

Note These Construction Features of Bemis "Dri-Tite" Tarpaulins —

1. Seams are double sewed with extra heavy rot-proof thread.
2. Corners are reinforced with an extra patch of canvas.
3. Rustproofed rolled rim spur grommets for extra strength.

**Protect
with Bemis
"Dri-Tite"
Tarpaulins**

BEMIS BRO. BAG CO.

622 S. Fourth Street, St. Louis 2, Mo.

Baltimore • Boston • Brooklyn • Buffalo
Charlotte • Chicago • Denver • Detroit • East
Pepperell • Houston • Indianapolis • Kansas
City • Los Angeles • Louisville • Memphis
Minneapolis • Mobile

New Orleans • New York City • Norfolk
Oklahoma City • Omaha • Orlando • Peoria
St. Helens, Ore. • St. Louis • Salina • Salt
Lake City • San Francisco • Seattle • Wichita
Wilmington, Calif.



Now!

a 47-ft. Tower

that "stands on its own feet" *

the "AMERICAN"

MATERIAL ELEVATOR

Here is the new "American" material elevator—a quickly erected, self-raising, 47-foot tower that operates without guys or bracing! Versatile, easy-to-use, it gives you a 40-foot lift of a 2500 lb. load on a lifting platform that accommodates two wheelbarrows or one concrete buggy! And it can be made higher by adding simple demountable sections as the job requires. Easily moved from job to job this new "American" is powered by the well-known 25 hoist—is already simplifying lifting problems on the widest variety of construction jobs.

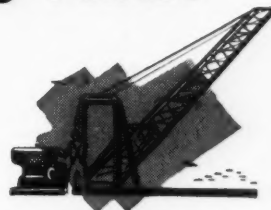


* No guys are required to support the 47-foot tower. When additional sections are used, guys are of course needed.

... 47-Foot Self-Raising Tower!



EASY TO MOVE This material elevator goes from one job to the next in a hurry. Demountable sections may be loaded on a single truck, unloaded and assembled quickly.



EASY TO SET UP Assemble the sections on the ground; the "American" swings its tower into place under its own power. It saves time and money wherever it's put to work.

SEND FOR DETAILS! A new bulletin illustrates in detail the specific advantages and operating features of this new "American" material elevator. Ask for bulletin No. 200D6.

AMERICAN

HOIST & DERRICK CO.

St. Paul 1, Minnesota

CHICAGO

NEW YORK

SAN FRANCISCO



REVOLVERS

LOCOMOTIVE CRANES

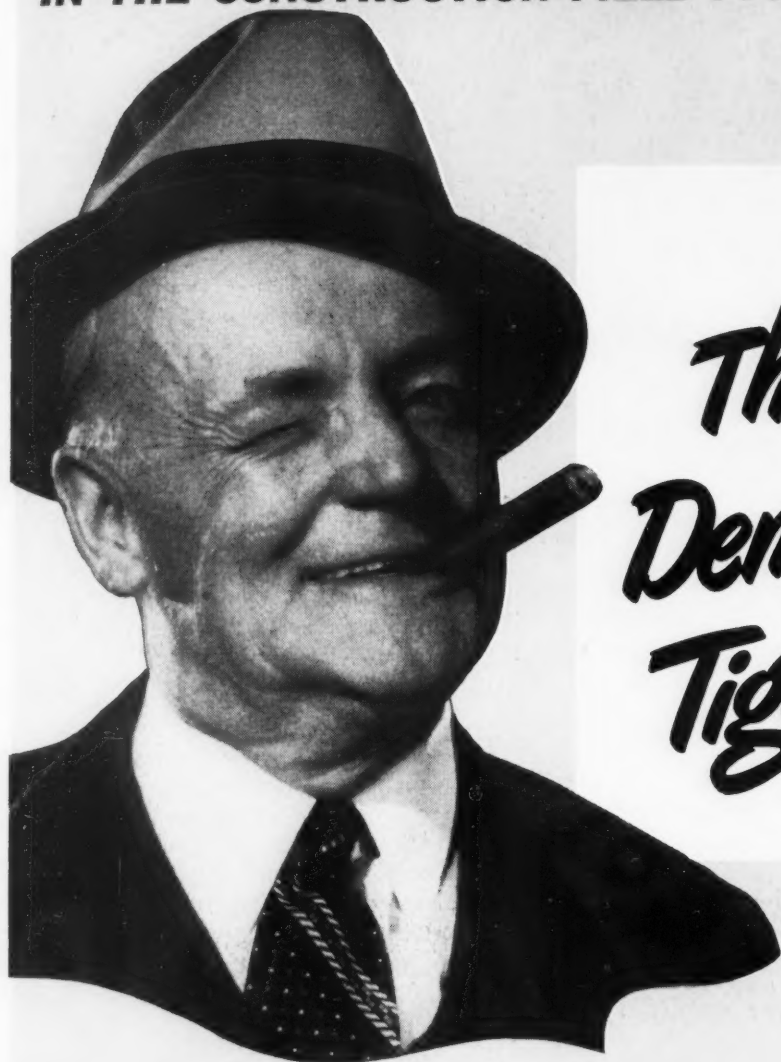
HOISTS

DERRICKS

BLOCKS AND SHEAVES

CROSBY CLIPS

IN THE CONSTRUCTION FIELD . . .



*The BIG
Demand is for
Tiger Brand!*

BECAUSE: It is extra strong and tough.

It offers maximum resistance to

bending fatigue and wear. It is safe and
easy to handle . . . behaves well at all speeds.

It is skillfully made to close tolerances

and unvarying quality standards.

It is backed by a Field Engineering

Service second to none.

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

COLUMBIA STEEL COMPANY

San Francisco

Tennessee Coal, Iron & Railroad Company, Birmingham,

Southern Distributors

United States Steel Export Company, New York

UNITED STATES STEEL

Excellay Preformed



Air Power does More Work for You... when supplied by a new **LE ROI AIRMASTER**

Yes, you get more feet of hole per shift from your rock drills; you get faster street repairs and speedier demolition work from your paving breakers, when a streamlined AIRMASTER supplies the air. The many new features that make the AIRMASTER line the greatest post-war development in portable air compressor design account

for this tremendous improvement in compressor and air tool performance.

AIRMASTER sizes range from 60 to 500 cfm. See your Le Roi distributor. Ask him about the new, fuel-saving Econotrol that maintains higher average working pressures; the efficient AIRMASTER valves, etc. Write for fully illustrated bulletins.

LE ROI COMPANY

Milwaukee 14, Wisconsin

New York • Washington • Birmingham • Tulsa • San Francisco



**LE ROI
MILWAUKEE**

TURN THE PAGE



Prompt Compressor Service If You Need It
This Basic LE ROI Policy Saves You Time and Money

Le Roi compressors are famous for economy, for dependability, and for speeding up the work. But, designing the best compressor isn't enough—that is why Le Roi has established modern service facilities in all parts of the country.

Furthermore, Le Roi has taken the time to painstakingly train the already experienced maintenance men in each distributor's organization—to teach them all about Le Roi compressors. This thorough educational program coupled with conveniently located outlets is your assurance of prompt, reliable service—there are no costly long shut downs when you use Le Roi compressors.

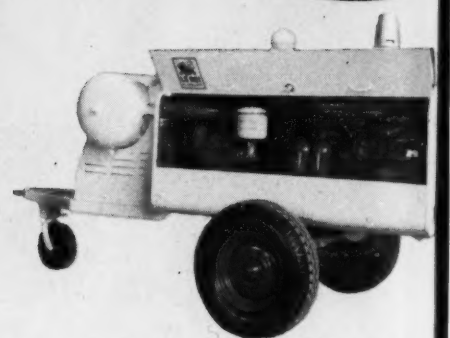
Visit the Le Roi distributor nearest you. Examine his service department. He has some startling news for you, too—ask him about the new Le Roi AIRMASTER line and the patented, fuel-saving Econotrol.

LE ROI COMPANY

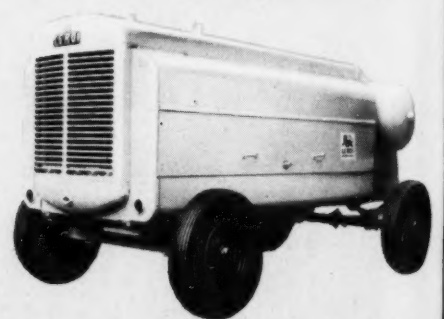
Milwaukee 14, Wisconsin

NEW YORK • WASHINGTON • BIRMINGHAM • TULSA • SAN FRANCISCO

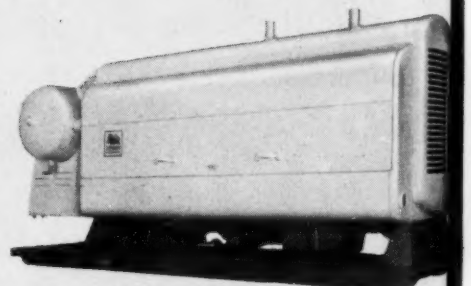
New AIRMASTER Compressors



Type E (2 pneumatic) AIRMASTER



Type C (4 pneumatic) AIRMASTER



Type A (skid-mounted) AIRMASTER



THE VERSATILE AUTOMATIC BUCKET

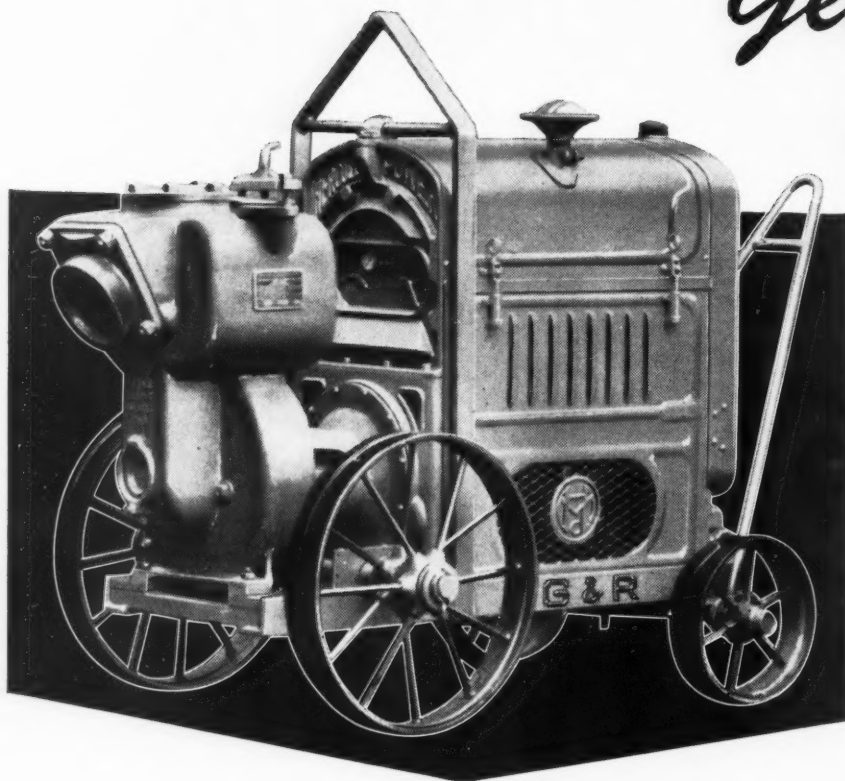
From coral reefs to excavating basements, the Page Automatic bucket has long met with success. Our capable engineers design every Automatic for the specific requirements of each job. From gold to sand, the Automatic will faithfully dig right in and come up with a full pay load in a minimum of time and effort.

Illustrations (reading from top to bottom) show: Placer Mining, Coal Stripping, Basement Excavating and Railroad Maintenance.

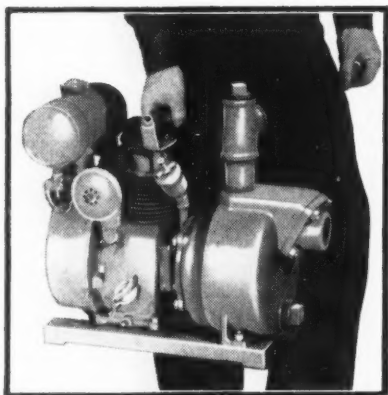


PAGE ENGINEERING COMPANY
CHICAGO 38, ILLINOIS

*Don't **GAMBLE!** Don't **GUESS!**
Get the **BEST**
by **TEST!***



Simplicity is the keynote of all Gorman-Rupp pumps. The Gorman-Rupp Heavy Duty Pumps are big, tough and dependable. The pump pictured above is the model 1602 (formerly model 90-M) with a capacity of 1500 gallons per minute at average total head.



The Gorman-Rupp "Midget" pictured here, the smallest of the lightweights, weighs only 60 pounds and is easily carried by one man. It will pump 3000 GPH at ordinary heads.

It won't cost you a cent to learn what pump will do the best job for you. Ask your distributor for the Gorman-Rupp pump that will best suit your requirements. Put it on the job and if it does not out-perform any other for size of pump, for power consumed and for dollar of investment, return it at our expense.

Do you need a pump as small and easy to carry as a bag of tools -- that will deliver 3000 gallons per hour? Or do you have a heavy dewatering job that calls for as much as 125,000 gallons per hour of continuous operation? What ever the application or size required, there is a rugged Gorman-Rupp self-priming centrifugal pump that will do the job better than any other pump you have seen.

For further information call your nearest distributor or write us for Bulletins.



THE

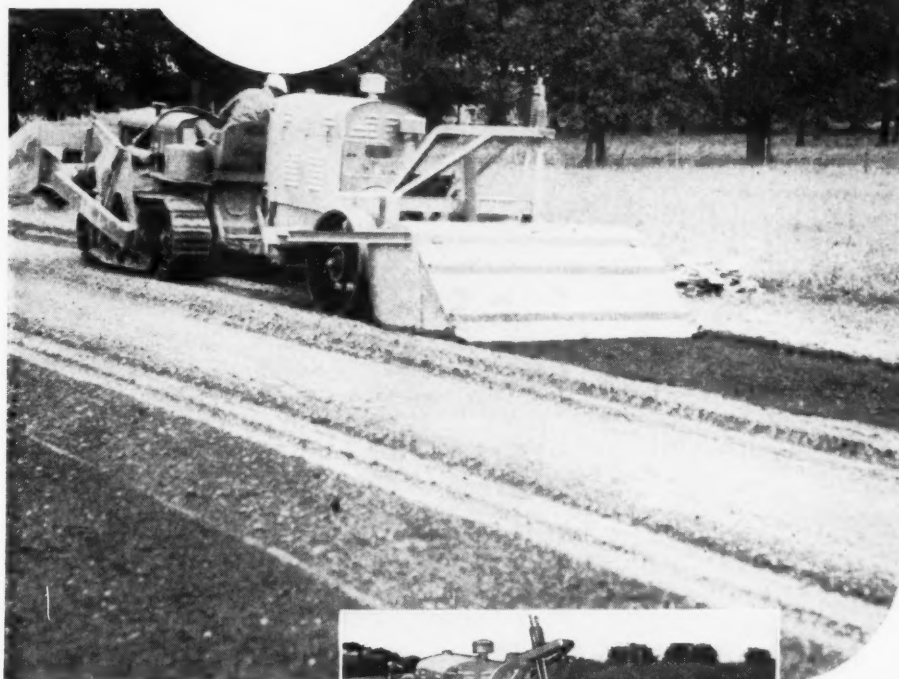
GORMAN-RUPP COMPANY

308 BOWMAN STREET • MANSFIELD, OHIO

**FOR STABILIZATION IN
SMALL, INCLOSED
AREAS... PARKING
AREAS OR LARGE
HIGHWAY AND
RUNWAY
PROJECTS**

IT'S THE

SEAMAN MIXER



IN PATCH WORK, there is a plus factor in the Seaman Mixer's high efficiency, for its low investment and economy permit small volume mixing at or close to the point of patching. No long haulage from stockpile to site or "guess-timates" in the amount of materials required.



C 119

Instantly appreciated by the alert contractor and engineer, is the Seaman Mixer's unique ability to mix,—then turn sharply and mix again in small, confined and irregular areas. Fence corners mean nothing more than a short reverse and out the Seaman comes, mixing thoroughly the instant the rotor is lowered into the material. Close to fences, too — the Seaman can be operated quickly and accurately . . . In stabilizing yards for equipment storage, factory yards,—driveways, roadside restaurant parking areas, airfield aprons and similar areas, this characteristic of the Seaman makes the machine essential . . . And of course, in road mixing on large areas,—the full economy of Seaman operation is quickly shown on job-cost records, for the high volume output of intimately mixed materials on a day-in, day-out production schedule has made the Seaman nationally preferred for every type of stabilization.

SEAMAN MOTORS

305 N. 25th Street

Milwaukee 3, Wisconsin

**SOIL
STABILIZATION
METHODS**

Now, out of the printer's hands and into yours, — the new, entirely revised and amplified edition of "Soil Stabilization Methods," — the informative, practical handbook compiled by SEAMAN engineers. Even if you have a copy from the previous edition, write for your copy of the new. Be sure to ask for Bulletin C-26.



It's **FIVE STAR**
★ ★ ★ ★ ★
but not FINAL

Architect: Larson & McLaren, Minneapolis. **Contractor:** C. F. Haglin & Sons, Minneapolis. **Dealer:** Landers-Norblom-Christenson Co., Minneapolis, Minn.

Minneapolis Star Journal Building. The black and white contrast is made especially effective by the use of black mortar. Lehigh Mortar Cement was used for all masonry, and Lehigh Normal for the concrete.

There's no doubt about it, the Minneapolis Star Journal is housed in a very snappy building. Its black and white brickwork is handsome and modern . . . what's more, it is weather-tight.

And here's the latest: After six years the Star Journal is so pleased with this structure that it plans an addition

in the same design—to be erected when construction controls ease off! Just as Lehigh Cements contribute to the stability of this newspaper building, so they will put maximum strength in your future construction. The demonstrated quality of Lehigh products assures you of the solid, lasting results you desire.



LEHIGH MORTAR CEMENT LEHIGH NORMAL CEMENT LEHIGH EARLY STRENGTH CEMENT LEHIGH AIR-ENTRAINING CEMENT
LEHIGH PORTLAND CEMENT COMPANY • ALLENTOWN, PA. • CHICAGO, ILL. • SPOKANE, WASH.

NO dead weight!

... that is why HEIL
earthmoving equipment
gives you larger payloads,
faster trips, and lower costs

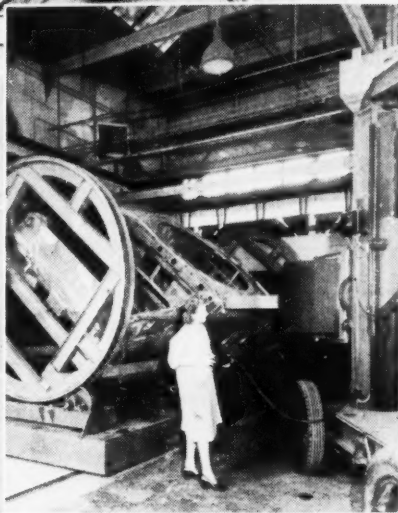
When you are moving dirt and rock, dead weight is like an anchor around your neck. Speed and load are reduced; schedules aren't met and profits disappear. • This problem led to progressive thinking by Heil engineers.

New all-welded designs for bulldozers, trailbuilders, scrapers, and bottom dump wagons were created. Materials with an extremely high yield point were used. The results, of course, are lighter sections and much greater strength — dead weight is removed. The welded joints themselves are stronger than the parent metal — there are no rivets, nuts, or bolts to fail. • Definite proof that Heil's lighter but stronger designs reduce earthmoving costs is found in actual job performance reports from all parts of the country. They show that the greatly improved weight-to-power ratio enjoyed by Heil users means larger loads and faster trips. You, too, can easily enjoy the benefits of relentless research and the development of new processes and fabricating techniques. Use Heil earthmoving equipment.



Here you see a positioner. It places the object to be welded in any desired position. This permits "down hand" welding for higher quality. That is why Heil's welded joints are stronger than the parent metal.

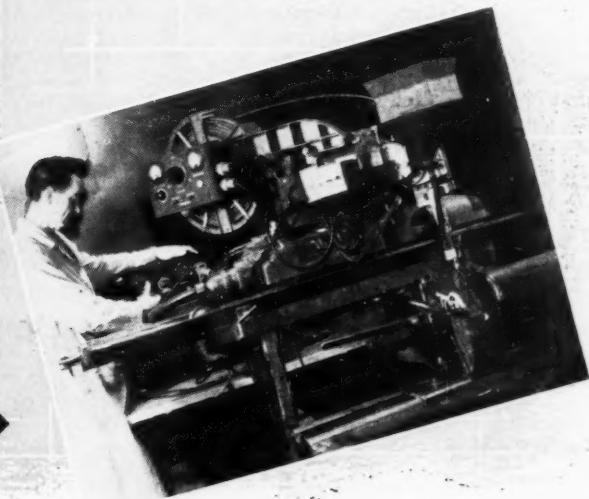
Nothing is left to chance at Heil. This X-Ray machine spot checks welds and castings. Quality control such as this accounts for the sturdy dependability of Heil equipment.



Submerged-Arc welding is an example of the modern technique used at Heil. It eliminates the human element — every weld is identical. The improved quality made possible by this new method is one of the reasons why Heil equipment gives less trouble and lasts longer.

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

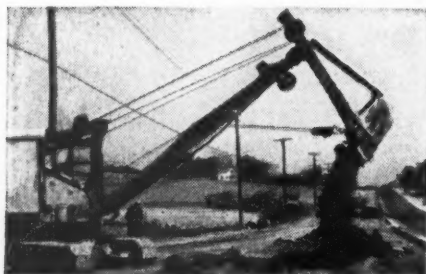
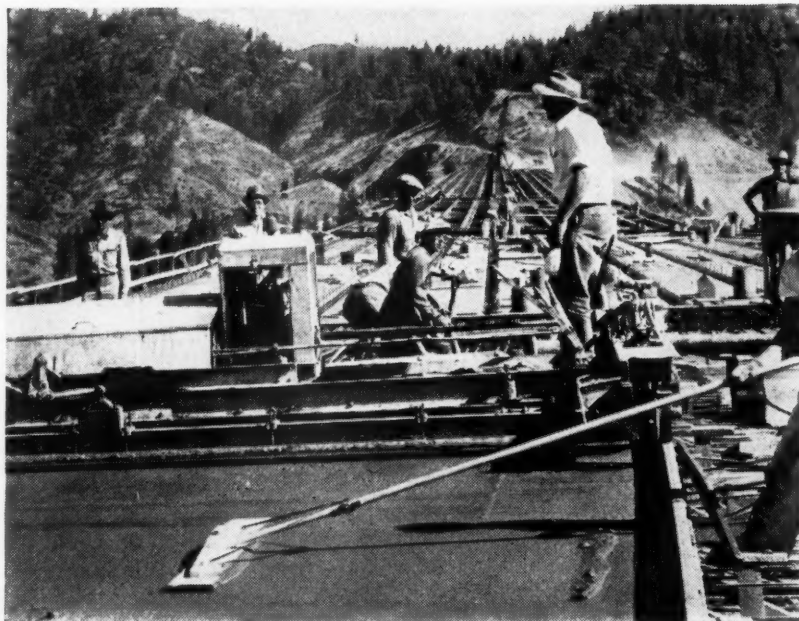


R-73

RUGGED STEELS... for RUGGED JOBS

That's what highway contractors get when they buy from Bethlehem's complete line of road-steel products. Whether it's steel to help in building the highway—or steel that becomes a permanent part of the road or right-of-way—there's a Bethlehem steel product to do the job.

Which is why so many contractors today are turning to Bethlehem Road Steel Service. They know that the products they get will be designed and built for rugged, lasting performance. And, what's just as important these days, they know that they get service that's helpful and reliable.



RUGGED WIRE ROPE

For equipment such as shovels, dragline excavators, ditchers, cranes, etc., you can't buy a tougher or stronger rope than Bethlehem's Purple Strand, made of Improved Plow Steel. And where conditions warrant—as they often will—buy it preformed (Form-Set is our name for it) so that it's less apt to kink or loop, won't bristle, and stands bending fatigue better, thus lasting longer.



RUGGED DRILL STEEL

If you need drill steel, for jobs like making shot holes, buy Bethlehem Hollow Drill Steel, rolled from steel with the toughness and hardening characteristics that this type of work requires. It's suitable for both forged-on bits and for fabricated rods with detachable bits. Bethlehem also supplies Solid Drill Steel for blacksmithing purposes, such as pinch bars, moil points, chisels.



RUGGED GUARD RAIL

Bethlehem produces a complete line of highway guard rail, with posts, brackets and other fittings, to comply with any state specifications. The rugged Cable Guard Rail, made of heavily galvanized strand, and the strong, resilient Cable Bracket mounted on a Bethlehem Steel Guard Post make a combination that's hard to beat. And where specifications call for even greater strength, there's the Safety-Beam Guard Rail, a smooth-surfaced, heavy-gauge steel rail which absorbs the impact of a runaway vehicle, tending to redirect it parallel to the rail. Especially adapted for bridges and bridge approaches.

LEADING BETHLEHEM HIGHWAY PRODUCTS

Road Joints	Reinforcing Bars	Bar Mats	Guard Rail
Guard Rail Posts and Brackets	Wire Rope and Strand	Structural Steel	Pipe
Hollow Drill Steel			Sheet and H-piling
Corrugated Sheets		Tie Rods, Spikes, Bolts and Nuts	

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

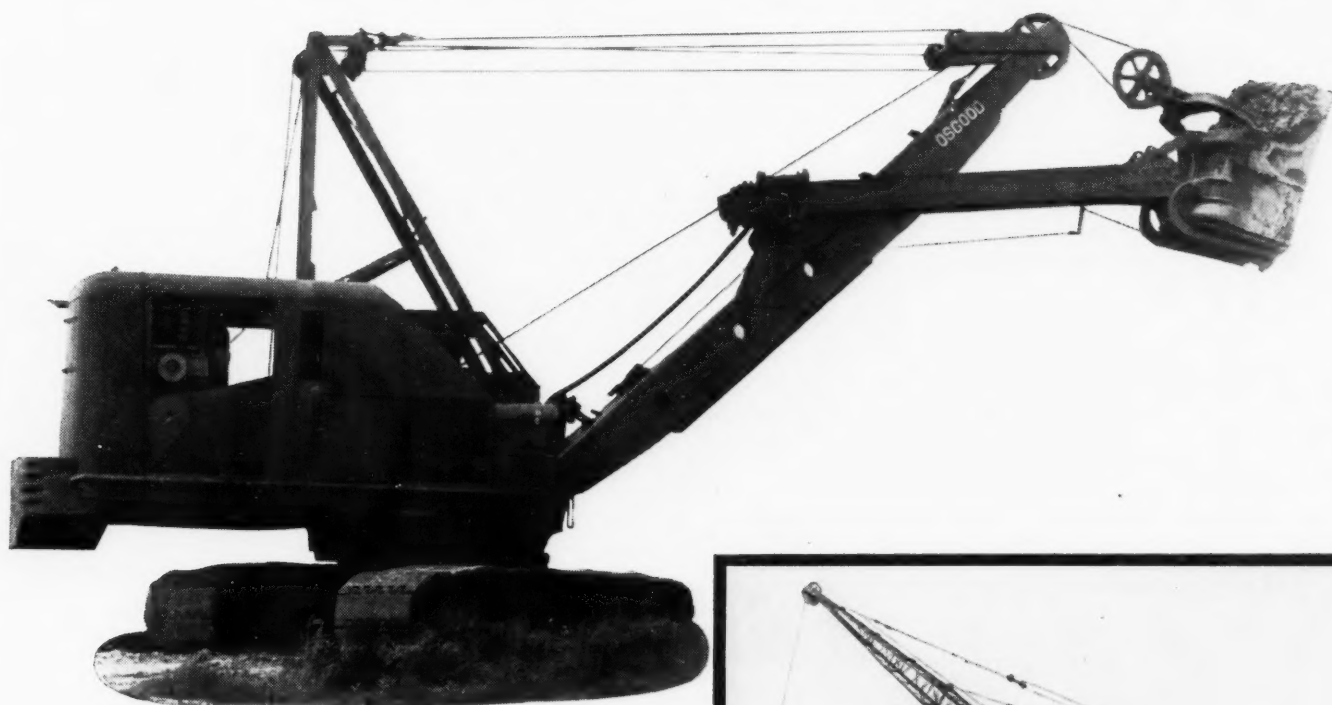
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

STEEL for HIGHWAYS



Built **FOR THE** *Big* **JOBS!**

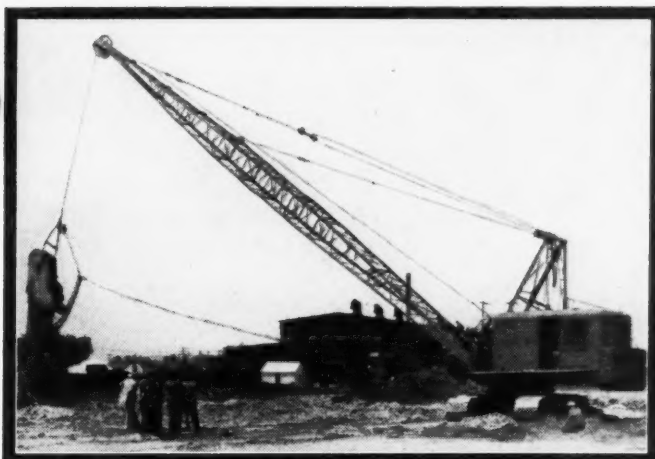
The **OSGOOD** Type 100



SHOVEL • DRAGLINE • CLAMSHELL • CRANE

From crawler treads to point sheaves, the new OSGOOD Type 100 is designed and built to handle the big jobs. As shovel, dragline, clamshell or crane, the Type 100 will wade right into the toughest work you have and turn in a profit-making performance. Powerful and sturdy, the Type 100 is completely air-controlled, providing an ease of operation that means just as much production in the last hour of the day as in the first.

Air booster brakes and air-controlled steering contribute to the smooth performance of the Type 100. A conveniently arranged bank of hand levers and foot pedals control every operation of this new machine. Positive air control enables the operator to get the "feel" of this powerful unit instantly. Self-clean-



ing treads, oversize point sheaves, a new quiet-operating swivel-type fairlead and a host of other features of interest to every construction, excavating and material handling engineer are completely described in the new Type 100 bulletin. Get your copy now!



FREE BULLETIN READY NOW
Write today for your copy!

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**CRANES, DRAGLINES
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OSGOOD
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"Your story better be good, brother!"

T.A.E.: "It *is* good, officer. I'm a Timken Axle engineer . . ."

Officer: "What's that got to do with highballing this baby way above ceiling?"

T.A.E.: "It's like this, officer. I'm road-testing* a new Timken heavy-duty Two-Speed Axle to see just how much it *will* take—and brother, it'll take plenty!"

Officer: "Yeah—I know."

T.A.E.: "But you *don't* know, officer. Why, you can drive this baby in low speed without it even working up a sweat!"

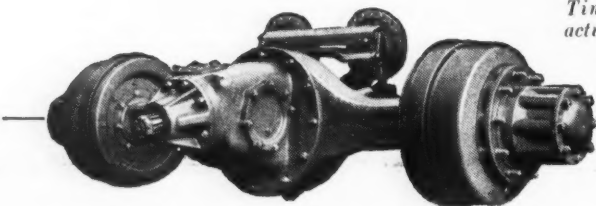
Officer: "Yeah—and it does all right in *high* speed, too."



T.A.E.: "High and low axle gear ratios are just right. Just the proper 'spread' to meet the greatest number of operating conditions. What's more, with the new Timken Easy Power Shift you can change axle ratios without clutching—and you don't lose vehicle speed."

Officer: "You can say *that* again."

**—It's true—Timken Axle engineers regularly get out on the road and check Timken equipment under actual operating conditions.*



New S & U-200 Single-Speed Double-Reduction Axle is a companion axle to new S & U-300 Two-Speed Double-Reduction. Designed for hauling over 18,000 pounds at tires on ground per axle, each offers these exclusive modern features: New hypoid-helical double-reduction drive . . . new differential with 9-16 tooth combination . . . new, stronger shaft design and stronger splines . . . new interjacent pinion shaft location . . . plus scores of others. Data on ALUMINUM housing, brake shoes and hubs on "S" Series for weight saving available upon request.



T.A.E.: "What's more, the new Timken Power Brakes on this baby are a dream—and brake chambers are in a new protected location."

Officer: "Now, there is some sense to that."

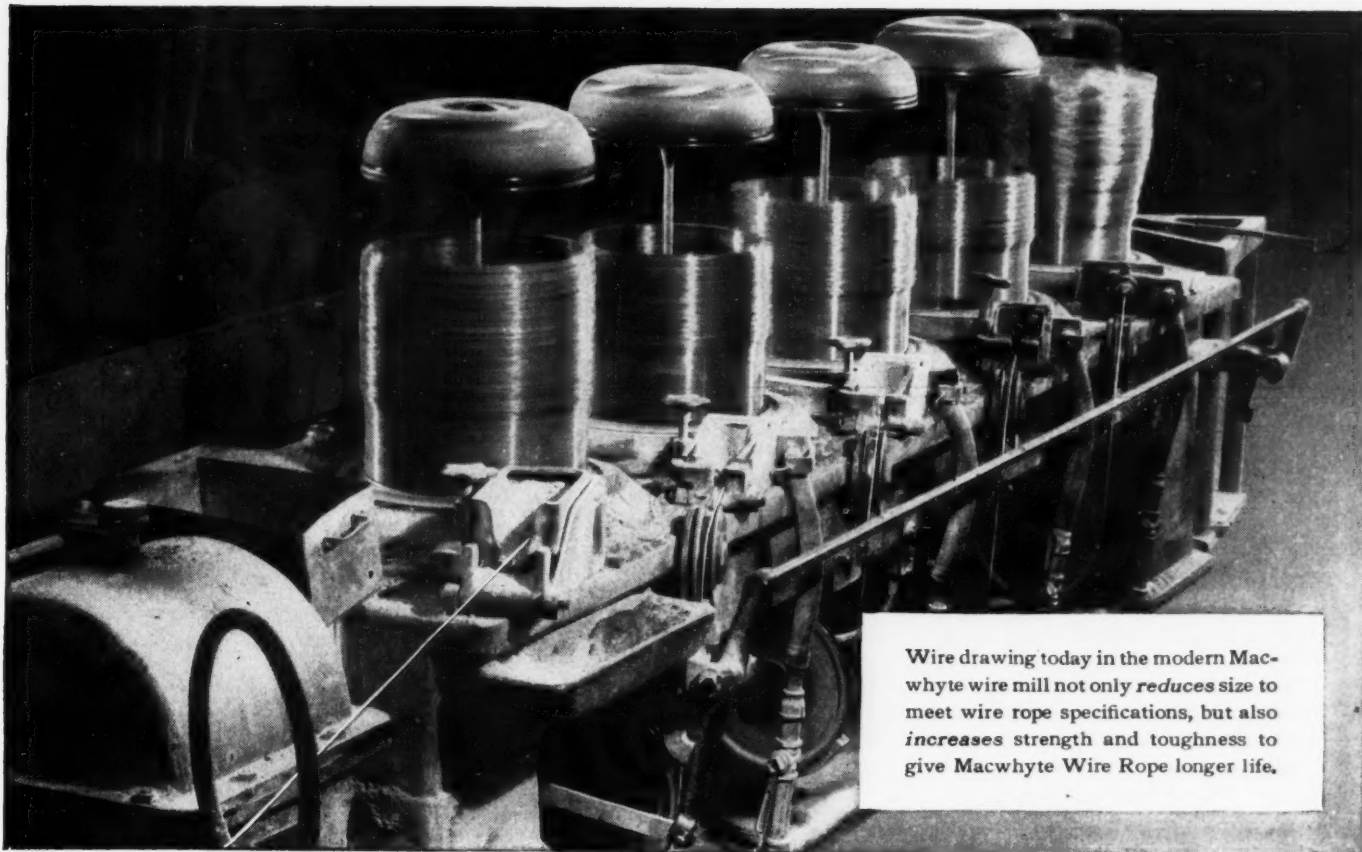
T.A.E.: "Say officer, in the interest of—er—better transportation, couldn't you let us continue our test without . . . well, you know . . ."

Officer: "Okay, boys! Away with you—before you talk me into giving you a police escort."



TIMKEN AXLES

THE TIMKEN-DETROIT AXLE CO., DETROIT 32, MICH.
WISCONSIN AXLE DIVISION • OSHKOSH, WIS.
TIMKEN AXLE BRAKE DIVISION • DETROIT 32, MICH.



Wire drawing today in the modern Macwhyte wire mill not only *reduces* size to meet wire rope specifications, but also *increases* strength and toughness to give Macwhyte Wire Rope longer life.

Metal flows cold **TO INCREASE YOUR DOLLAR VALUE** *in Macwhyte Wire Rope*

You get a better, longer lasting Macwhyte Wire Rope, because we cold-draw rope wire from heat-treated wire rods.

Tungsten-carbide dies, polished to a satin-finish with diamond dust and oil, are used. The wire is p-u-l-l-e-d through the dies cold. This results in an extremely smooth round wire of practically double strength with great flexibility to resist bending fatigue.

Precision Wire drawing by Macwhyte (ex-

clusively for Macwhyte Wire Rope) is another reason why Macwhyte PREformed internally lubricated wire rope is your best buy.



Here's a helpful wire rope buyer's guide: The 170-page, completely indexed Macwhyte G-15 catalog will be sent free if you are a wire rope user. Just write or call any Macwhyte distributor.



MACWHYTE WIRE ROPE

Manufactured by Macwhyte Company
2941 Fourteenth Avenue, Kenosha, Wisconsin

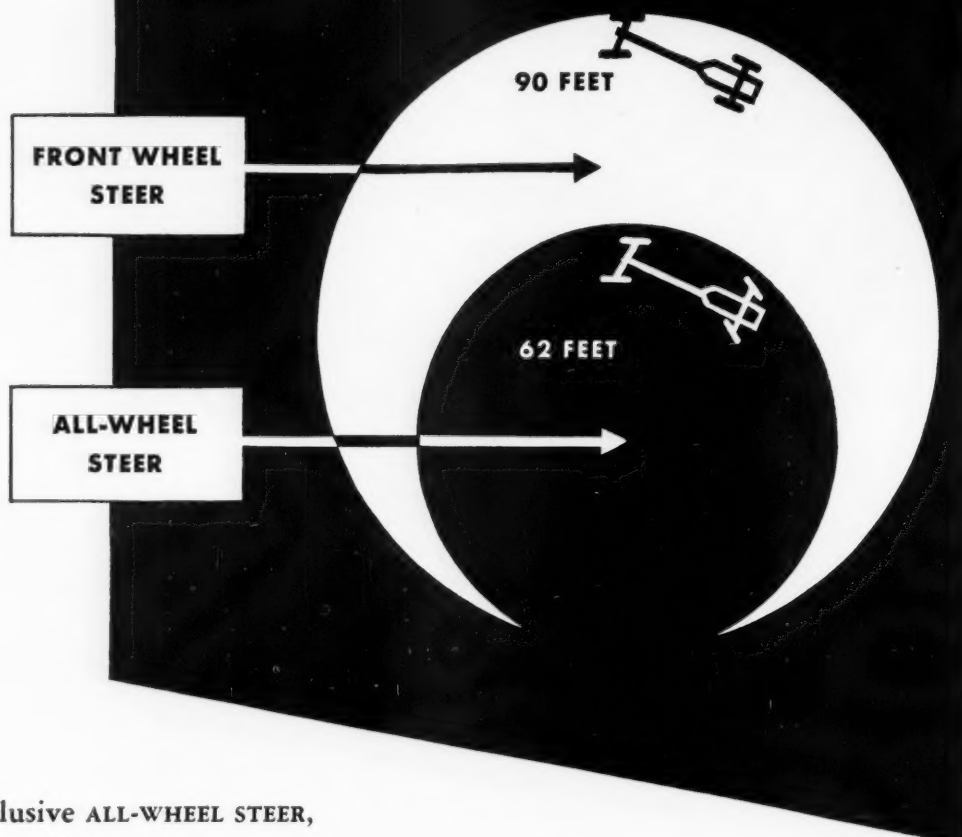
Mill Depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle
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MACWHYTE PREformed and Non-PREformed Internally Lubricated Wire Ropes . . . MONARCH
WHYTE STRAND Wire Rope . . . Special Traction Elevator Rope . . . ATLAS Braided
Wire Rope SLINGS . . . Hi-Fatigue Aircraft Cables, Assemblies, Tie-Rods . . . Stainless Steel
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Make MACWHYTE your headquarters for WIRE ROPE and SLINGS

PAYS OUT in performance!

These two circles, with their 62 foot and 90 foot diameters, graphically demonstrate the increased maneuverability that results from All-Wheel Steer.



By reason of its exclusive ALL-WHEEL STEER,
the "99-M" Power Grader—

WORKS around corners where other motor graders cannot work

GOES places where other motor graders cannot go

SAVES time and money on practically every job

No Motor Grader without All-Wheel Steer can hope to equal the all-around performance of the "99-M"

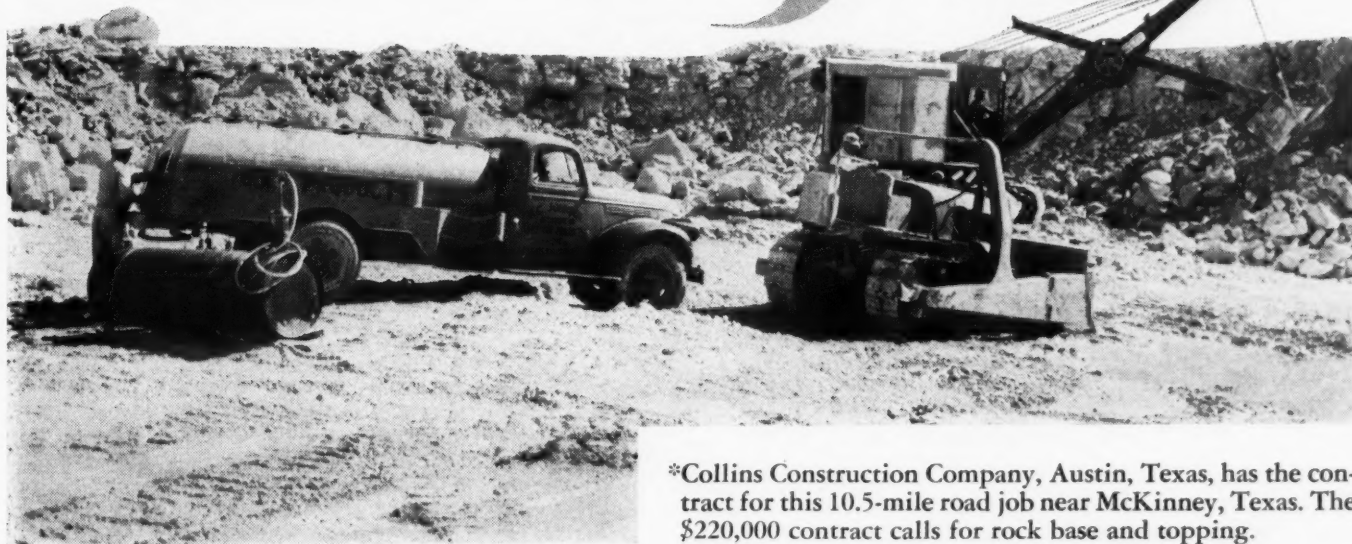
AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U.S.A.

BUILDERS OF ROAD MACHINERY
Austin A Western
SINCE 1859

Good equipment plus Gulf Products

equals
better job performance

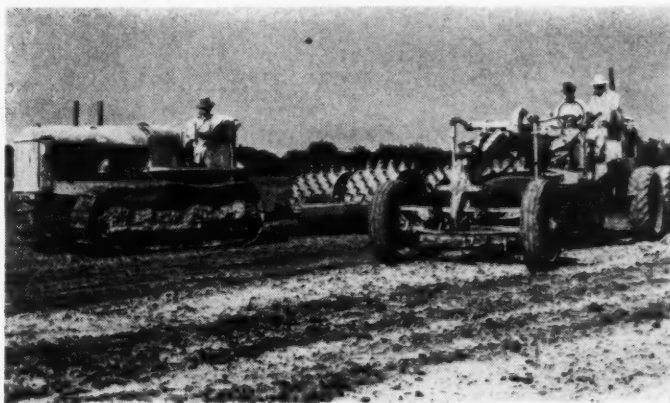
says highway contractor*



*Collins Construction Company, Austin, Texas, has the contract for this 10.5-mile road job near McKinney, Texas. The \$220,000 contract calls for rock base and topping.

“**W**ITH Gulf quality lubricants and fuels in service, we’re getting efficient, trouble-free performance from our modern equipment on this road job,” says this Contractor*. “In addition, our operating and maintenance costs are low. Gulf products help us do a speedier, more profitable job.”

Leading contractors on all types of construction jobs find it’s good profit insurance as well as real economy to use Gulf lubricants and fuels. Always of the same uniform high quality, these Gulf products work as a team to keep equipment operating at top efficiency with minimum expense for maintenance and repairs. Call in a Gulf Lubrication Engineer and ask him to recommend the proper types and grades exactly suited for your particular requirements.



No matter where your job is located, you’re sure of quick delivery of Gulf quality products through more than 1200 warehouses located in 30 states from Maine to New Mexico. Write, wire, or phone your nearest Gulf office today.



Gulf Oil Corporation · Gulf Refining Company, Pittsburgh, Pa.

Why You Need **B-G** Finishers For Large-Area Surfacing

• An important requirement for large area surfacing—such as airport runways, super highways, parking lots, playgrounds, etc.—is that there be *no ridges or breaks in the entire surface area*. With so many of these jobs coming up now and in the near future, B-G Finishers are even more important to you.

These Tamping-Leveling finishers match the joints evenly—they compact and tamp each succeeding strip firmly in place against the previous one.

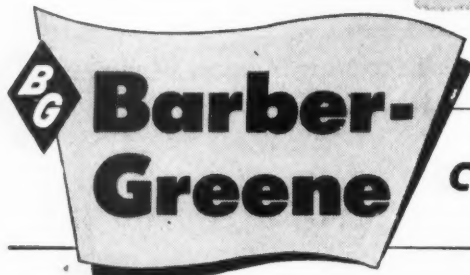
Because of this even compaction across the full width of the mat (including the joint) you get a ridge-free continuous surface area. There is the same density across the joint that there is in the rest of the strip.

The B-G Tamping-Leveler finisher will lay any mix, hot or cold, loosely graded or sheet asphalt—and up to 6 inches thick. Also, it gives you a mat of uniform density and a smooth level surface over an irregular sub-base.

Your Barber-Greene representative has catalogs on Barber-Greene asphalt equipment and data on its performance on jobs like yours. Barber-Greene Company, Aurora, Illinois.



Barber-Greene tamping-leveling finisher laying 4½ million sq. ft. of black top for 130 acres of parking lot at the Santa Anita race track. Griffith Company, contractors.



CONSTANT FLOW EQUIPMENT



LOADERS



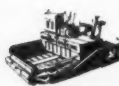
PERMANENT CONVEYORS



DITCHERS



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FINISHERS



BITUMINOUS PLANTS



COAL MACHINES

**MAKE YOUR
NEXT
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or Dragline**

**a LIMA
3/4 YD. Paymaster**

The LIMA PAYMASTER, because of its high output, excellent performance and low-cost operation is making new friends wherever it goes. Even beyond field records, the acid test of detailed comparison places the PAYMASTER at the top of the list in modern engineering features and construction.

Listed below are a few of the advantages you get when you buy a LIMA PAYMASTER:

WELDED, BOX-TYPE BOOM	INDEPENDENT BOOM HOIST
TUBULAR DIPPER HANDLE	SILENT CHAIN POWER TAKE-OFF
ANTI-FRICTION BEARINGS	CHAIN OR CABLE CROWD
SQUARE LEVER SHAFTS	EASE OF CONVERTIBILITY
HOOK CONE ROLLERS	FAST, MOBILE CRAWLER TRUCK

Use coupon below for requesting a copy of bulletin No. 034C which illustrates and describes the LIMA PAYMASTER.

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Shovel and Crane Division, LIMA, OHIO
OFFICES IN PRINCIPAL CITIES

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SHOVELS, 3/4 YD. TO 5 YDS.

DRAGLINES, VARIABLE

CRANES, 13 TONS TO 100 TONS

MORE Grip and Go for GRADERS!

Cutting a high bank slope on a road reconstruction job, this Grader is tired with Goodyear Sure-Grips for maximum traction and fast operation.

O-P-E-N C-E-N-T-E-R
self-cleaning tread
more grip
more traction

WHAT you see above is not only a grading job, but a *low-cost* grading job—because that operator is getting maximum traction, minimum slip, from his Goodyear Sure-Grip tires.

The reason is straight and simple. Sure-Grips give more grip and go because of Goodyear's *open center* tread design. It keeps each lug

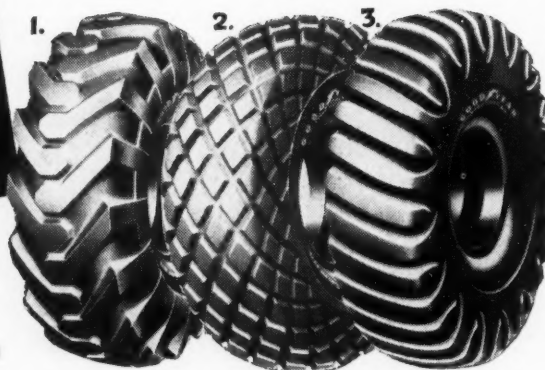
bar completely separate—gives each one a bite edge right in the heart of the traction zone. So the *entire* lug digs in full depth, full length, and *grips*. And with no connected lugs to form mud-traps that pack up and cause excess slip, Goodyear *open center* tread is fully self-cleaning, always deep-biting.

On the drive wheels of work units — from road graders to giant earth movers—Sure-Grips have no equal. Year after year of low-cost, high-hour performance prove *that*. That's why they're *first choice* with veteran contractors everywhere — and why it will pay you to buy and specify Goodyears for your units.

GOODYEAR

**BUY and SPECIFY
GOODYEAR
—it pays!**

**MORE YARDS ARE MOVED ON GOODYEAR
OFF-THE-ROAD TIRES THAN ON ANY OTHER KIND**



THE RIGHT TIRE FOR EVERY JOB

- 1. SURE-GRIP** for maximum traction on drive wheels
- 2. ALL-WEATHER** for drawn vehicles and general traction
- 3. HARD ROCK LUG** for all rock work

Sure-Grip, All-Weather—T.M.'s
The Goodyear T. & R. Co.

Construction Methods

WALDO G. BOWMAN, Editor

Volume No. 28

AUGUST, 1946

Number 8

PORTABLE BELT

Conveys Sand Loaded by Power Shovel

A PORTABLE FIELD BELT operating on a sectionalized idler system and an 80-ft. lift conveyor are producing 1,500 tons of sand and gravel daily for the Rubber City Sand & Gravel Co. in Akron, Ohio. Engineered by the Goodyear Tire & Rubber Co. the layout uses approximately 1,700 ft. of 24-in. belting.

The field belt, illustrated herewith, operates on 580-ft. centers, servicing a power shovel in the sand pit and is designed to handle all the sand the shovel will load in continuous operation. The shovel bucket is dumped into a screening hopper that eliminates impervious material and provides the belt with a regulated supply of sand. The field belt rolls on idler sections that can easily be moved to the site where the shovel is operating.

A second field belt, arranged at a 90-deg. angle, hauls the material to the lift belt, which operates on 268-ft. centers and carries the sand on a 30-percent grade up the 80-ft. tipple to the screening plant, washer and storage silos, from which trucks are loaded by chutes. The seven-ply fabric lift belt, powered by a 40-hp. motor has been operating nearly five years without noticeable wear, according to Hal Knight, general manager of the operating company.



LIFT BELT, 268 ft. long, on 30-percent grade raises sand to 80-ft. height for discharge to screening plant, washer and storage silos.

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FIELD BELT (below) covering distance of 580 ft. receives regulated supply of sand from hopper fed by power shovel. Belt 24 in. wide rides on sectionalized idlers that can readily be moved to site of shovel operations.



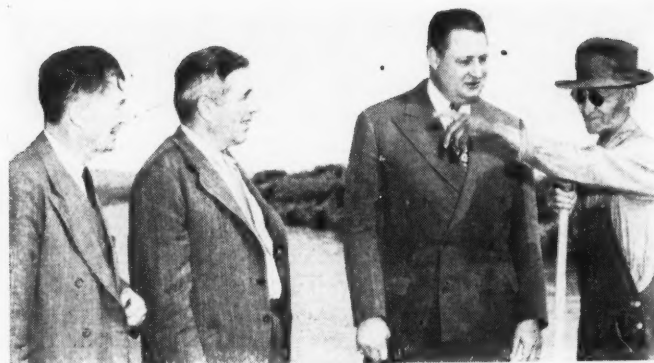


CANTON DAM AND RESERVOIR PROJECT on North Canadian River in Oklahoma is under supervision of U. S. Army Corps of Engineers, with Amis Construction Co. and C. F. Lytle Co. having principal contract. Construction of this rolled-fill earth dam, which will be 14,300 ft. long and 68 ft. high and create a reservoir with 390,000-acre-ft. capacity, was resumed recently after having been suspended during war. Here Euclid wagons enter borrow pit.

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NEW FORD RESEARCH AND ENGINEERING CENTER (below) on 500-acre tract in Dearborn, Mich., on which construction will start as soon as government regulations permit, will cost \$50,000,000 and will take 8 years to complete. Dome-shaped structure in foreground at end of artificial lake is engineering exhibit building. School is at right and styling building at left. Cross-shaped structure (top, left) is dynamometer (engine test) building. Administration and main engineering building is opposite dome structure.

THIS MONTH'S NEWS REEL



PACIFIC NORTHWEST is toured by Secretary of the Interior J. A. KRUG to gain first-hand knowledge of his department's problems. Here he gets views of Idaho farmer on Bureau of Reclamation's Boise irrigation project. Left to right are: R. J. NEWELL, regional director of bureau; MICHAEL W. STRAUS, commissioner of reclamation; MR. KRUG; and FLOYD JEFFERY.

MEXICO'S BIGGEST CONSTRUCTION BOOM is now under way, with many structures like this large apartment building (below) going up in Mexico City.





FEDERAL WORKS AGENCY CONFERENCE brings together division engineers of Public Roads Administration, Public Buildings Administration and Bureau of Community Facilities in Washington, June 10-12. Department heads (front row, left to right) are: **LESTER E. BOYKIN**, PRA solicitor; **H. G. HUNTER**, PBA assistant commissioner; **GEORGE H. FIELD**, B. of C. F. commissioner; **MAJOR GENERAL PHILIP B. FLEMING**, Federal Works Administrator; **THOMAS H. MACDONALD**, PRA commissioner; **W. E. REYNOLDS**, PBA commissioner; and **HERBERT S. FAIRBANK**, PRA deputy commissioner.



NEW HOUSING is springing up all over world. Here is group of small concrete houses built at Santa Cecilia, Brazil, to house workers at new Volta Redonda steel plant.



LIGHT 8-IN. HYDRAULIC DREDGE built by Higgins, Inc., New Orleans, La., will be used by Venezuelan government for river and harbor work. Plant weighs only 22 tons and is capable of digging to 15-ft. depth. Power for suction pump is supplied by 100-hp. six-cylinder gasoline engine, while two auxiliary engines with reduction gears operate cutter head and winches. Five water-tight steel compartments bolted together form 40x16-ft. hull.



BAILEY BRIDGE is pushed on rollers across Chattahoochee River near Gainesville, Ga., to replace structure washed out by flood. Nine structures, of type which served in all theaters during war, were purchased by Georgia State Highway Department. This 360-ft. span was erected in 5 days by 14-man crew.

HARLEM HOUSING PROJECT (below) named for James Weldon Johnson, deceased Negro poet, will be ready for occupancy by 1,310 families early in 1947. Ten buildings, ranging in height from 6 to 14 stories and containing two-, four-, five- and six-room units, will be constructed by New York City Housing Authority. Recreational facilities will also be provided in 12-acre area between 112th and 115th Streets and Park and Third Avenues.

Wide World Photo



Step Step by FIELD METHODS

Detroit Rebuilds Street Railway Under Heavy Traffic



BOSS of the Woodward Ave. track replacement job is **WILLIAM LANE** (left), supervisor for Detroit Street Railways, shown here with his assistant, **L. STOCKTON**.

FIRST STEP in track replacement is to lay temporary tracks directly on pavement outside of permanent tracks for continued street car operation. Temporary rails, fabricated into track sections with steel tierods and pipe spreaders, but without ties, are spiked to asphalt pavement. At intervals track is tied to dowels drilled deep in pavement to prevent longitudinal creeping. Outer rail is blocked up where required by crown of pavement. About 1¼ mi. of temporary double track, moved ahead as job progresses, is needed to bypass reconstruction operations.

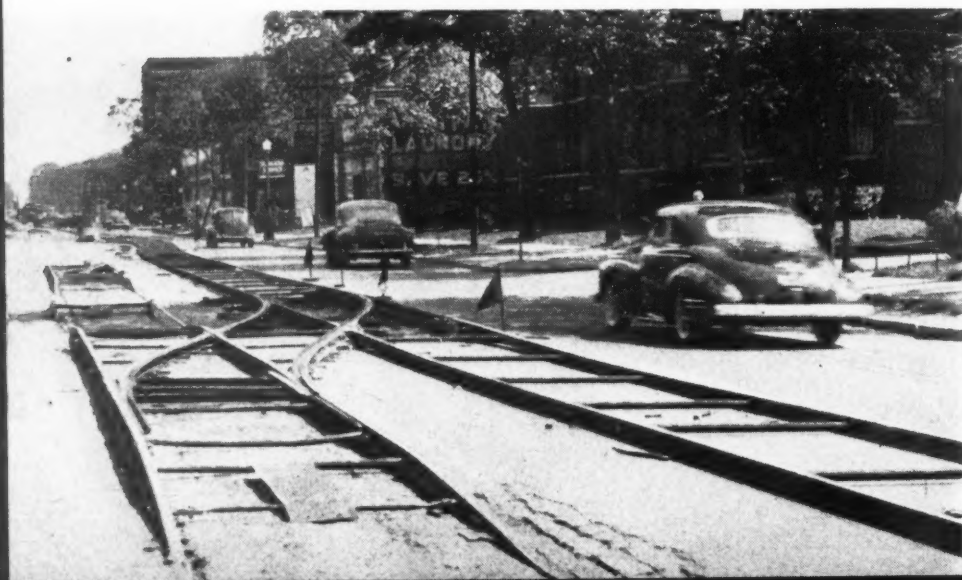
STREET CAR TRACKS along 3½ mi. of Detroit's Woodward Avenue, one of the busiest thoroughfares in the world, are being rebuilt by the maintenance forces of the Detroit Street Railways with no interruption of rail traffic and little interference with vehicles. It is a busy

job, involving temporary tracks, old track and base removal, laying new all-welded-joint rail and replacing base concrete and paving. To speed up the work, all operations possible are fully mechanized. The job is progressing at the rate of 300 ft. per day, but it takes about

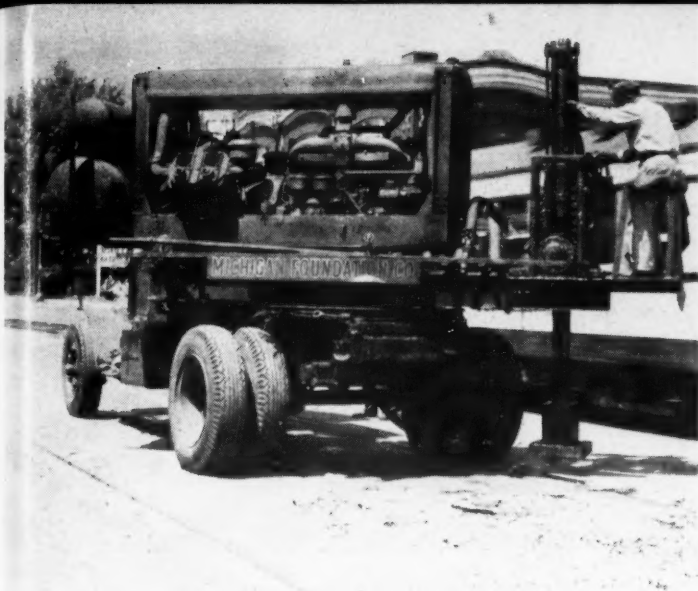
a month for the complete cycle of work to pass a given point, starting with laying of temporary track to removal of barriers over the 14-day cured concrete.

William Lane, supervisor in charge for the railway, has set up various size crews that work on a functional basis, each performing the same task throughout. The job is like an automobile assembly line, but instead of the work moving past the men, the men move along the work in proper sequence.

Step-by-step details of this inter-



← **2** AT BOTH ENDS of the project transfer between permanent and temporary tracks is by California type switches, easily moved ahead to keep up with job. Parking on Woodward Ave. is prohibited along job, so street capacity is not reduced much by presence of temporary tracks.



3 TRACK REMOVAL starts with breaking up of concrete and granite-block rail liners for full width from outer rail to outer rail on both tracks, with this concrete buster, owned by Michigan Foundaion Co. Rig consists of truck-mounted air hammer, riding on revolving bed along with Worthington compressor. This machine breaks up concrete to base of rail, 7 in. below street surface.



4 AFTER CONCRETE and block incasement is broken loose, rails are pulled by Bay City truck crane fitted with heavy tongs. As rails are lifted from broken pavement they are cut into 20-ft. lengths with acetylene torches. Tierods and spreaders of track structure also are burned off. Old track, completely concrete-incased, had no ties.

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esting job are shown in the accompanying pictures with explanatory captions. The project is under the general direction of Phillip A. Kerwin, Superintendent of Ways and Structures. L. Stockton is asisstant to Mr. Lane on the job. Though municipally owned, the street railway system is operated as a separate corporation.



5 FOLLOWING BEHIND rail pulling outfit is Byers shovel, owned by Frank J. Knight Co., which loads broken concrete into trucks for disposal. This operation cleans out track right-of-way to 7-in. depth.

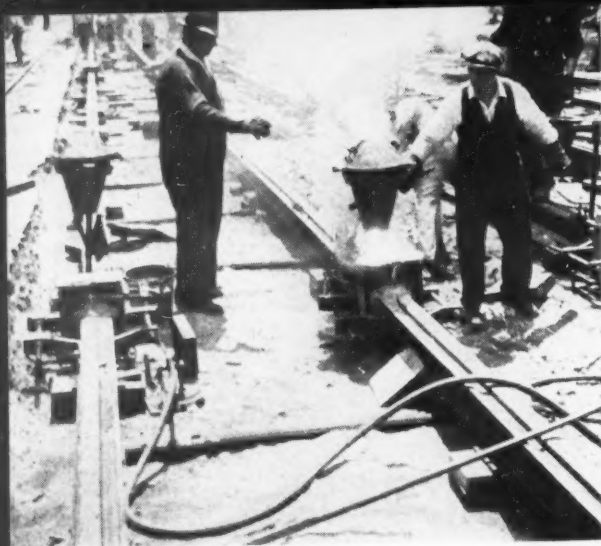
6 STEEL RAIL BRIDGE (below) spanning excavated track bed keeps cross streets open to traffic. Bridges are made up of old rail pulled on job, cut to 20-ft. length, turned over and framed into solid deck by straps welded to bottom flanges. Approaches and fills across temporary track are built up of cold asphalt mix. Bridges are again placed at cross streets before new concrete is opened up to traffic.



(Continued on next page)

7 LAST STEP IN TRACK REMOVAL (below) is breaking up and removing old concrete base below former bottom of rail, not disturbed by air hammer that breaks up concrete between and alongside rails. This base is taken out down to top of original ties, laid 35 years ago, which were left in place when street was regraded long ago. Top of ties is 7 in. below both old and new bases of rail. Crew with pneumatic concrete busters powered by fleet of portable compressors removes old base, which is loaded by shovel or clamshell into trucks for disposal.





8 NEW RAILS ARE LAID and roughly blocked up, then are welded into one piece by thermit process as shown here. Rail sections are clamped with bridles at each joint, then thermit pots are set in place, charged and ignited to fuse rail ends together. New rail is 122-lb. groove or chair section, 7 in. high.



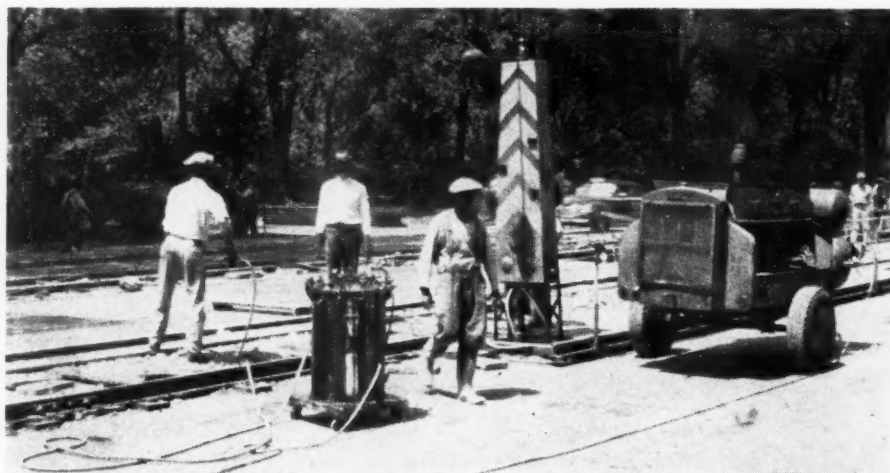
9 TRACK IS LINED UP and blocked to final position by section gang. Track shown here is made up with tunnel-type steel ties, serving as spreaders only, which railway had on hand. Elsewhere track is fabricated with steel tierods and pipe spreaders without use of ties. Wood blocking is incased in concrete, which is poured flush with rail chair lip.

Step by Step FIELD METHODS ... con't.



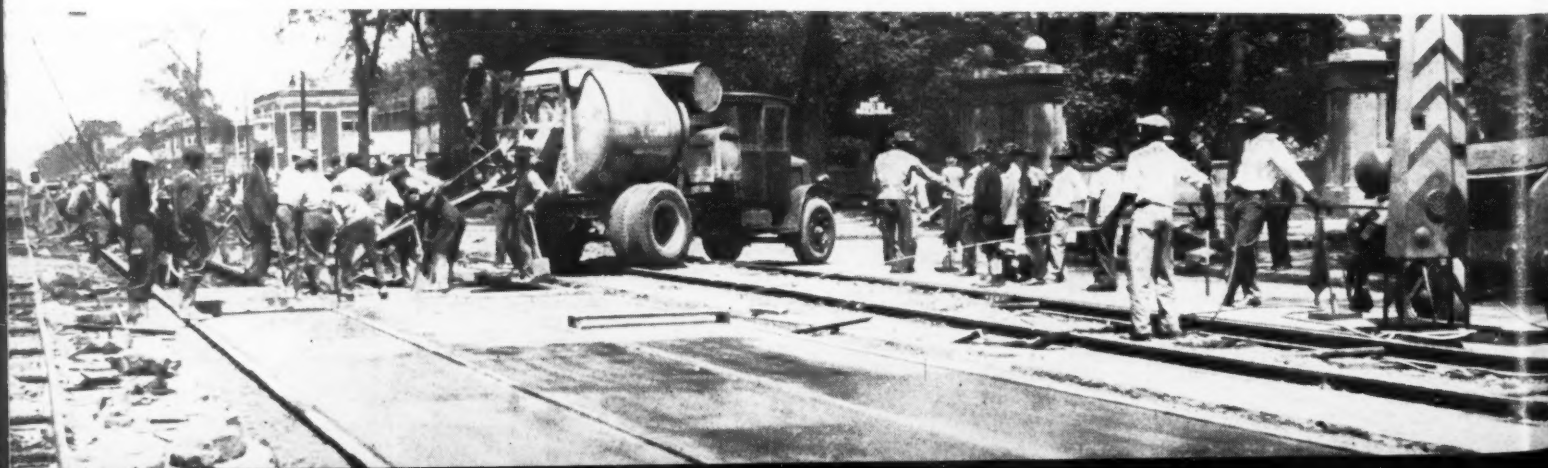
10 ELECTRIC DRIVE GRINDERS, taking power from trolley wire, grind down thermit welds at joints to smooth running surface. Grinders are mounted on four-wheel pipe frames that operate on track. Workman in foreground is giving base final broom cleaning ready for concrete.

Page 84



12 CURING COMPOUND is Truscon Laboratories' "True-Cure," sprayed with compressed air outfit on fresh concrete directly behind screeding operations. Shown here are LeROI compressor furnishing air, curing liquid supply tank and spraying operations. One outfit easily keeps up with concrete crew finishing 300 ft. of track per day.

11 TRANSIT MIXERS deliver concrete direct to place. Concrete is placed under and between rails and between tracks from outer rail to outer rail. One side of street is closed for 1 or 2 blocks in vicinity of concrete placing to permit transit trucks to maneuver without interference from traffic. Only finishing is screeding, done as fast as concrete is poured. Crew spraying liquid curing compound follows right behind finishers. After 14 days of curing, concrete paving is put into service and street cars are routed back on to permanent tracks. City will repave street between curbs and outside rail on each track. Granite block rail liners are not replaced.



Quick-Tilting Leads On Floating Piledriver

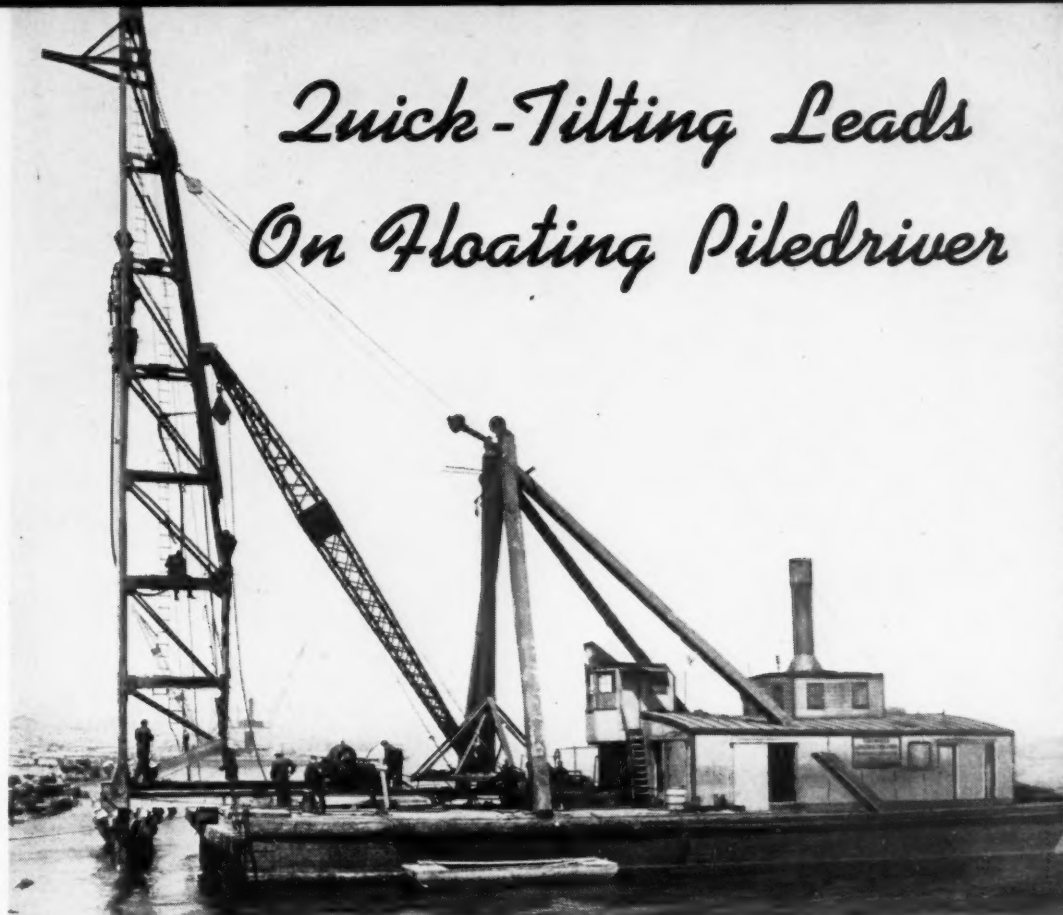
TIDEWATER CONSTRUCTION CORP., of Norfolk, Va., has converted an old stiff-leg derrick barge into a clever floating piledriver whose leads can be quickly tilted both forwards and backwards for driving piles up to 5 on 12 batter. The leads are mounted in the front of a 60-ft. steel tower hinged to a bed frame cantilevered out at deck level from the barge bow end.

Along the back of the tower is a pair of steel guides along which the tip of the derrick boom slides. The boom tip slides from midpoint of the guides when the leads are vertical to top of guides when the leads are tilted backwards and to the bottom for forward tipping.

Tipping and control of the tower and leads is by two lines from the derrick hoist drum. The regular boom line has been fastened to a point on the rear of the tower above the guides. This line pulls the tower backwards. Forward tilting is by the derrick hoist line, reeved through a set of blocks between the lower part of the tower and the sliding boom tip. When this line is tightened, and the boom line slacked off, the boom tip is pulled downwards in the guides, throwing the tower forward. The tower can be held in any position merely by tightening both lines.

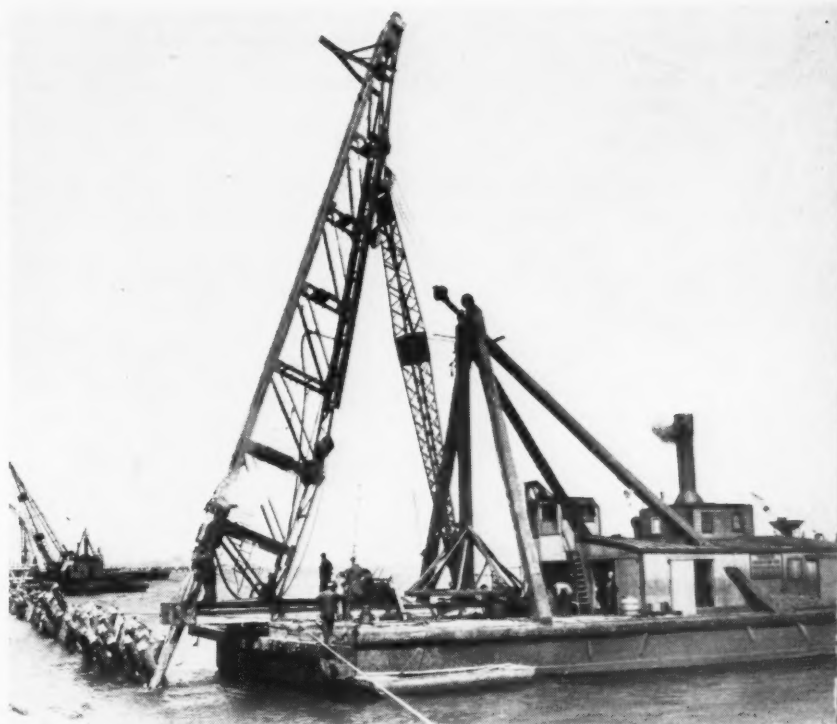
A separate two-drum steam hoist has been mounted in the tower bed frame for handling the hammer and pile. For additional stability, the tower is guyed to timber outriggers at the front of the barge.

The tipping action of the tower is so fast that the leads are returned to vertical position for inserting a new pile. Thus, one of the common troubles in batter piledriving is avoided, that of setting the new pile into tilted leads.



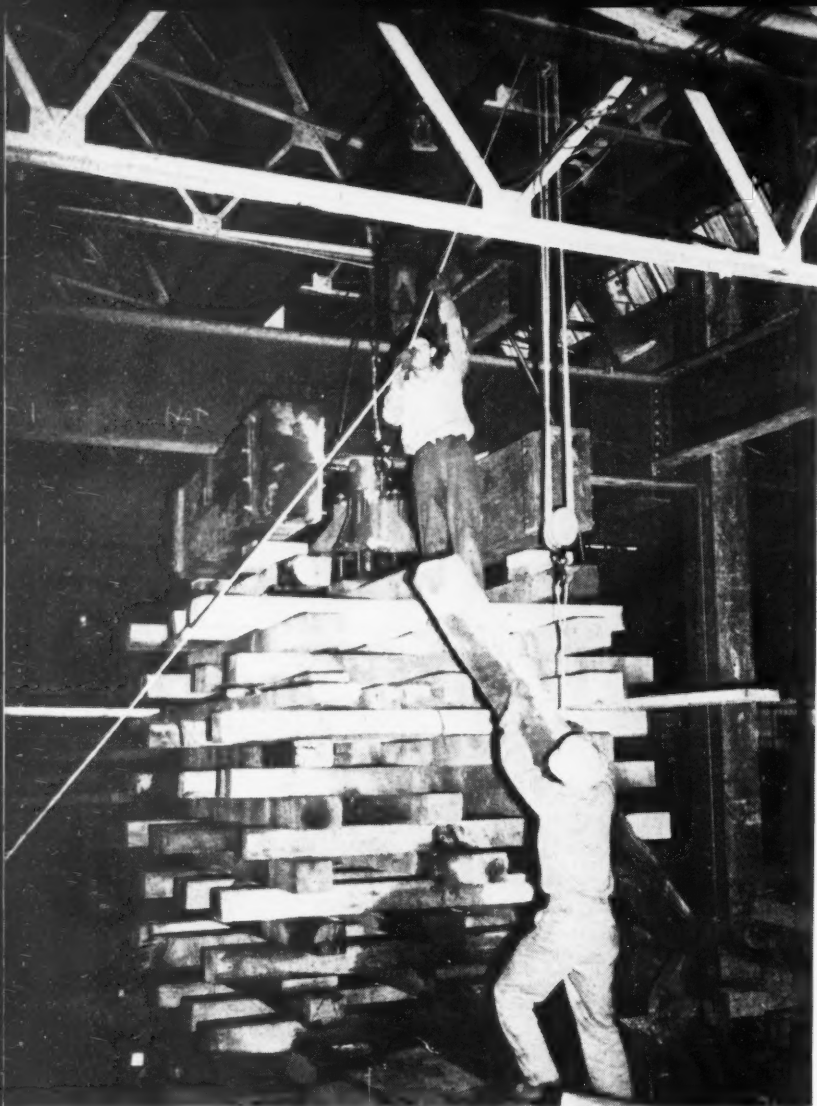
1 NEW IDEA in batter piledrivers is Tidewater Construction Corporation's new floating rig, converted from an old barge-mounted stiff-leg derrick. Derrick boom tip slides in guides at back of tower to regulate position of leads. Tower and leads are shown here in vertical position.

2 TO TILT LEADS backwards, derrick boom line, attached to top of tower, is tightened while lower line, coming off derrick hoist drum, is slackened. Note extreme batter of piles, 5 on 12, driven with this rig.



3 PULLING DERRICK BOOM downwards in guides with derrick hoist line pushes tower and leads forward. Tower can be held in any position by taking a strain on both upper and lower lines. Note separate steam hoist on tower bed frame for handling pile and hammer.

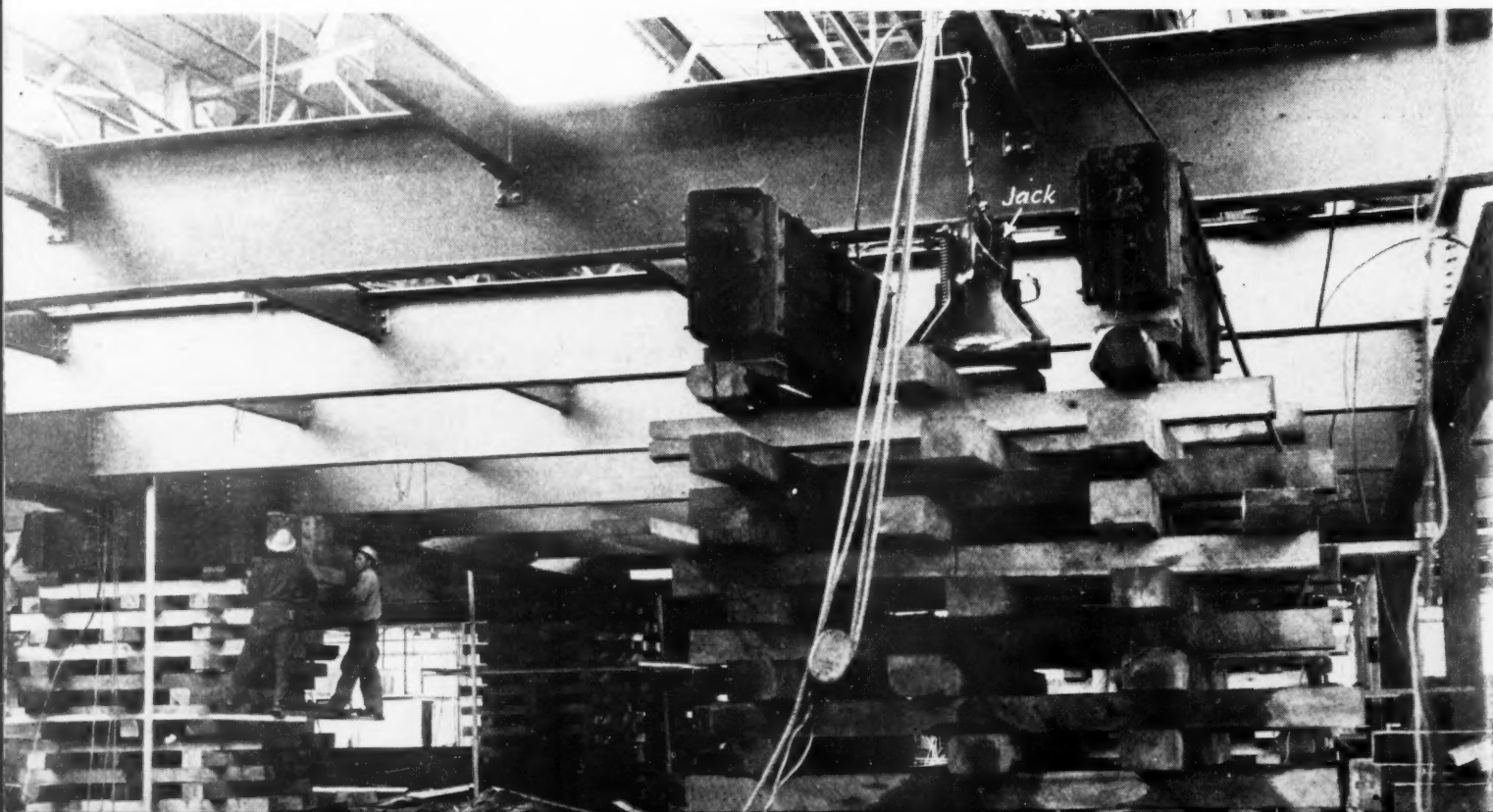




NEW SECOND FLOOR IS JACKED into place in one story assembly plant building to furnish space for processing and storage of automobile bodies. Cribbing supports framing and jacks during lifting operations that raise section 1 ft. per hr. Three lines of 6x8-in. oak timbers 8 ft. long, handled by block and falls, form each level of crib.

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HYDRAULIC JACKS (below) lift roof and new second floor. Coil springs on 110-ton Watson-Stillman jack retract piston into jack body when pressure on ram is removed. Two pairs of 12x12-in. timbers are clipped to girder on either side of jack and are raised along with steel.



Roofs on Industrial Bu

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U P S

RAISING THE ROOF—literally—was part of the job of the Walter A. Stanley Construction Co., in reconverting from wartime airplane manufacture the Tarrytown, N. Y. Chevrolet assembly plant of General Motors Corp. Structural steel for a second floor that was being added to the one-story steel frame plant building was assembled on the ground inside the structure, and the existing columns supporting a monitored roof were framed into the new steel. Second floor framing, together with the roof, was jacked up 14 ft. and new first story columns were inserted. Consider-

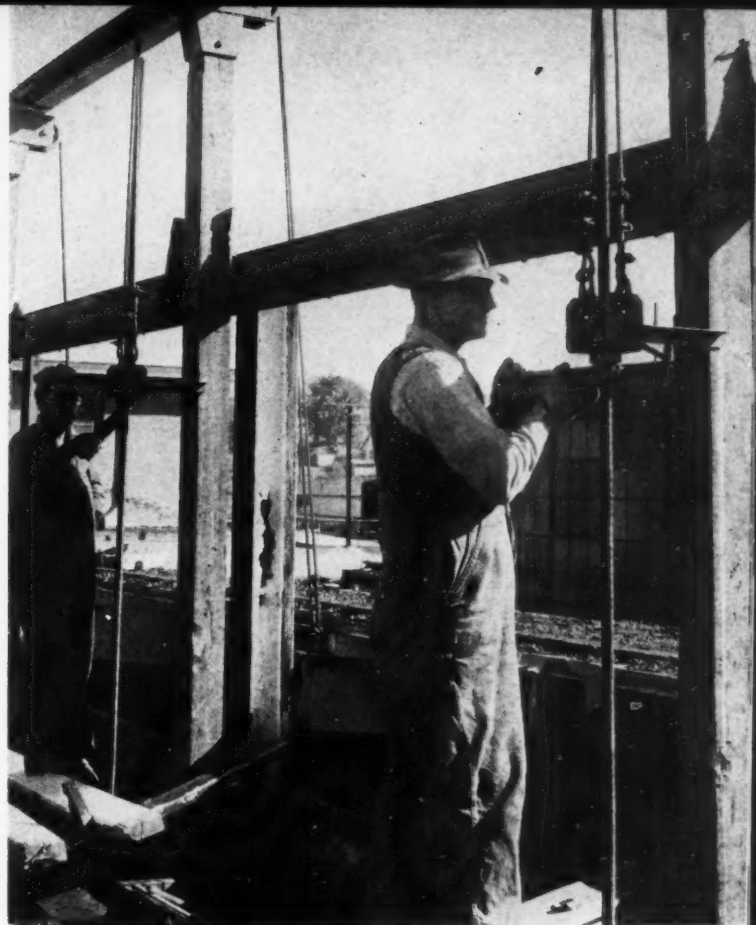
(Continued on page 88)

Buildings Have Their

Downs

LOWERING THE SAWTOOTH sections of an existing roof to a horizontal position proved an economical method of providing a flat roof necessary as part of the modernization of the Drayton Mills textile weaving plant at Spartanburg, S. C. Flattening the sections, rather than removing and rebuilding the roof, saved time and material and enabled the plant to function uninterruptedly on a three-shift basis while alterations to the structure were made. The contractors, Daniel Construction Co., Inc., devised what they called a sky hook that held the sawtooth by cables while sup-

(Continued on page 89)



LOWERING DEVICES, called sky hooks, support high ends of sawtooth roof beams and lower the section as nuts and swiveled housings to which beams are cabled ride up threaded rods anchored to main roof steel. Section is lowered 9½ ft. in 3 hours.

By **MARVIN C. ELLISON**

Mechanical Engineer.

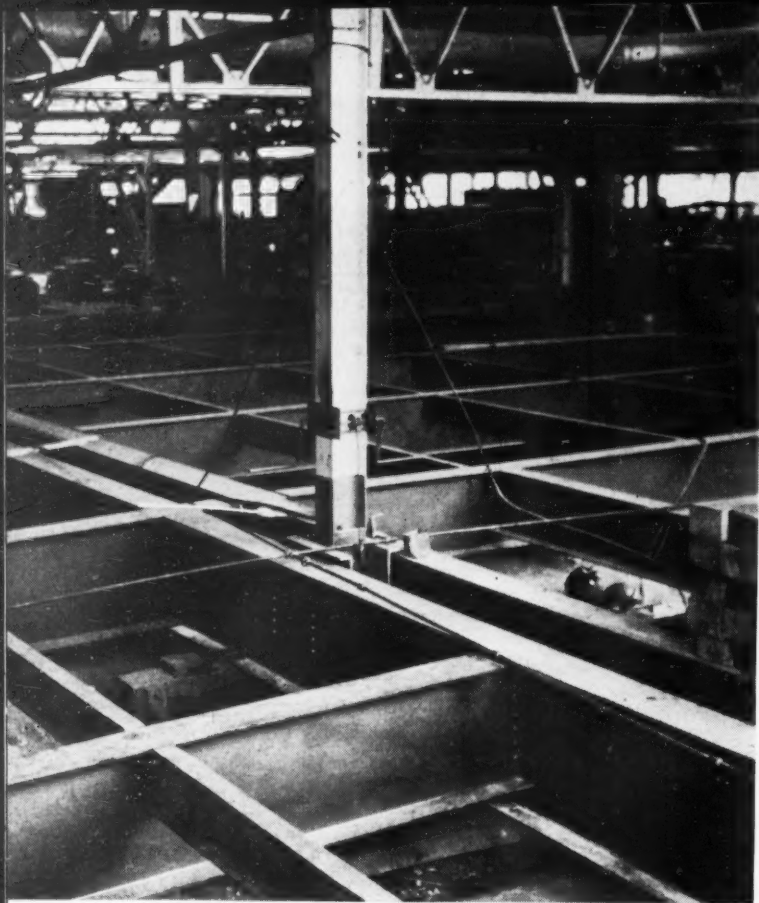
DANIEL CONSTRUCTION CO., INC.

Greenville, S. C.

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ROOF BEAMS (below) are trimmed to fit between existing girders to which they will be welded when beams are leveled. Low ends of beams are cabled to threaded eye-bolts supported on adjacent sawtooth.





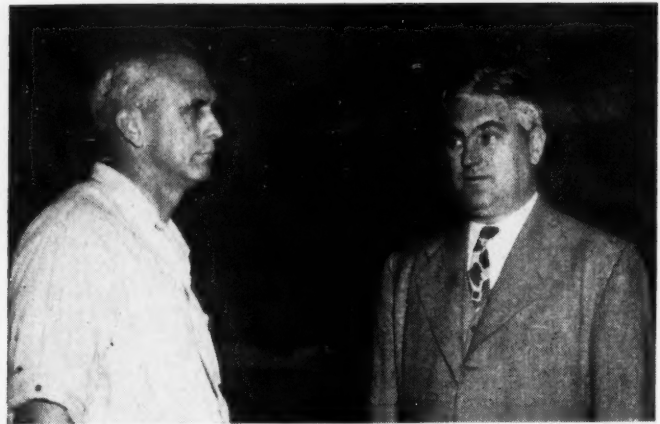
STEEL IS ASSEMBLED and riveted on ground. Existing roof columns are framed into new steel after which second floor framing and roof are jacked to proper elevation. Jacks, of 60 and 110-ton capacity, have 9-in. maximum lift and operate at 6,000 psi. developed by air-driven hydraulic pump. Windlasses on column raise jack and retract jack ram between each 6-in. stage of 14-ft. total lift.

able economy resulted from this novel erection procedure since it was unnecessary to disassemble and reerect the roof structure, and because second floor steel could be riveted upon the ground. An additional advantage over conventional

methods was that the work proceeded under cover, unhampered by weather.

Since the second floor addition to the assembly plant is to be used for the processing and storage of car bodies, heavy second floor framing

Roof Raising...Continued



CONTRACTOR INSPECTS his roof raising operations at Chevrolet assembly plant of General Motors Corp. in Tarrytown, N.Y. WALTER A. STANLEY (right) president of Walter A. Stanley Construction Co., Ossining, N. Y. confers with JOHN J. SULLIVAN, his superintendent.

was required; floor girders are 27- and 33-in. rolled sections. Existing column footings were inadequate to support the expected heavy loading and new pile and concrete footings were placed, offset 5¾ ft. from the old. A special low-head piledriver, operating in 14-ft. headroom, drove 12,000 lin. ft. of 10-in. steel pipe piles in 8-ft. welded lengths.

Bays in the area of the alteration are 40 ft. square, and a second floor area of 30 bays, involving about 700

(Continued bottom next page)

Page 88

TIMBER POSTS (below) support roof trusses of one-story section of building while second floor steel and roof of adjoining section are jacked up. Trusses will be riveted to old first story columns whose lower ends, which were previously drilled, are shown nearing second floor level. New column (right) supports adjacent previous lift, and is offset from old to rest on new footing to take heavy second floor loading.



Roof Lowering

... Continued

porting framing and sash were removed, and that lowered the section by means of nut and threaded rod assemblies to which the high side was cabled.

The mill building is a steel frame brick structure, and had six lines of sawtooths, each 450 ft. long and 28 ft. wide, on the roof. This type of roof, with large areas of glass exposed, made it difficult to maintain the correct temperature and humidity needed for efficient textile manufacture. Elimination of the sawtooths, and erection of two large penthouses containing new air-conditioning equipment, ended the difficulty in controlling the atmosphere within the mill.

To lower a full 450-ft. sawtooth as a unit was impractical, and each length was lowered in three sections; two of 170 ft. each and one of 110 ft. In preparation for lowering a section, the roof deck was cut at section boundaries, and the sash in the sawtooth was removed. The valley ends of the roof beams, which were on 10-ft. centers, were cabled to long threaded eye-bolts supported on the adjacent sawtooth ridge, while the high end of each roof beam was supported by a sky hook. This device consisted of a 1¼-in.-dia. vertical rod having an oversize nut with swivelled housing riding a continuous machine thread cut along the rod's entire 11-ft. length, a vertical 6x6-in. timber post with a double-sheave yoke assembly fastened to its top, and two lengths of wire rope. The lower end of the rod and the post, with its sheaves projecting above the sawtooth ridge,



SAWTOOTH SECTION is swung to horizontal position to provide flat roof for textile mill. Plant operations in weaving room below continue uninterrupted as 80-ton section, 170x28 ft., is lowered. Total of 75,600 sq. ft. is lowered in 18 sections.

were anchored to the main roof steel; while the cables, passing over the sheaves, had one end fixed to the high end of the roof beam and the other end fastened to the nut housing on the rod. A sky hook was mounted at each roof beam of the section being lowered. Removal of the beam connections and trimming the beams to proper length to span between existing roof girders when the sawtooth was swung flat, left the section suspended by cables and completed the preparations for lowering.

Workmen stationed at each sky-hook lowered the high end of the sawtooth by slacking off the nut and housing to which the supporting cables were fastened. The high end was swung down 9 ft. 8 in. at the rate of about 3 ft. per hr., until the beams reached a horizontal position. The roof section was held to proper elevation by adjusting the

sky hooks and the threaded eye-bolts at the other ends of the beams while the new connections between beams and girders were welded. After the suspending apparatus was unhooked and moved to the next section to be lowered, column tops and framing which projected above the roof level were cut off and the roof surface was patched to complete the flattening procedure.

Daniel Construction Co., Inc., Greenville, S. C. were the contractors for the work described. C. A. Thrasher, chief engineer, and J. E. Moore, construction superintendent, devised the lowering rig with the help of the Greenville Steel & Foundry Co. who manufactured the device. Lockwood Greene Engineers, Inc., Spartanburg, S. C., prepared designs for the building alteration. Buensod-Stacey, Inc., New York City, installed the air-conditioning equipment.

Roof Raising

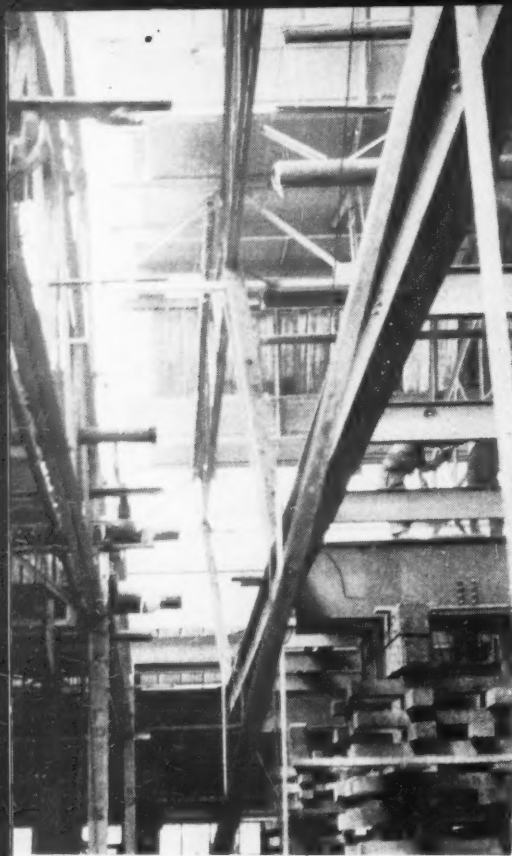
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tons of new steel framing, was erected. The contractor divided the job into four sections; three were 80x120 ft. each and the fourth was 120x160 ft. Sections were jacked individually, with 15 jacks raising

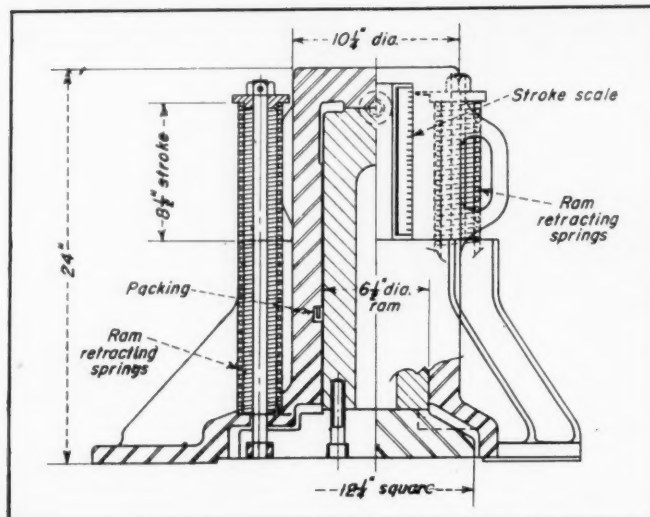
each of the small sections and 20 being used for the large one. After the footings were in, the second floor steel was assembled and riveted on pairs of two bolted 12x12-in. timbers placed adjacent to each old column. These columns were framed into brackets on the new steel, the lower ends of the framed columns were burned off, and jacks were placed between the blocking under the girders. Piping and conduit run-

ning through the roof trusses were cut at the boundaries of the section being raised, and the concrete roof slab at the edges were broken out. Adjacent trusses were temporarily supported on 8x8-in. timber posts, purlins at the section ends were held by temporary posted trusses, and after connecting rivets had been cut out, the lifting operations were started.

Hydraulic jacks with capacities of



TEMPORARY TRUSSES, posted to new steel, support purlins at edge of section during lift. After section adjoining at left is raised, piping will be reconnected and purlins will be rebraced into old trusses. Second floor, involving 700 tons of new steel framing and an area of 48,000 sq. ft., is raised in four sections. Largest unit, 160x120 ft., is raised by 20 jacks.



RAM MOVES DOWNWARD in new Watson-Stillman 110-ton jack shown here in split section. Four coiled springs retract extended ram when hydraulic pressure is released. Reversing usual ram movement permits jack body to remain lashed to member being raised and eliminates jack handling between lifting stages.

Roof Raising ... Continued

60 and 110 tons, operating under a pressure of 6,000 psi., were connected through a manifold to an air-driven pump. The jacks' lift range of 9 in. enabled 6x8-in. oak timbers 8 ft. long to be placed at each of the jacks for cribbing, and three lines of timbers in both the lateral and transverse directions were placed for each crib to give firm

support to the steel and jacks. After each lifting stage, the 60-ton jack pistons were retracted by raising the jack body with cables attached to job-built windlasses mounted on top of the girders, while the 110-ton Watson-Stillman jacks had spring-retracted pistons, saving considerable time over the conventional type. Jacking and cribbing continued at the rate of about 1 ft. per hr. until the second floor steel had been raised to proper elevation 14 ft. above footings. The operation was completed by setting new columns and making connections to adjacent previous lifts. A reinforced concrete

second floor slab was poured, and new sash and siding were installed for the first story.

The reconversion and expansion work was done by the Walter A Stanley Construction Co., Ossining, N. Y. under the general supervision of W. A. Stanley, president, with John J. Sullivan superintendent in charge. Wilcox & Erickson, New York City, were structural engineering consultants for the contractor, while Bethlehem Steel Co., for whom George Gundersen was superintendent, was subcontractor for the steel erection. E. L. Wright is plant manager for the owners.

Here's Enough Talent to Rebuild the World

THESE FIVE BIG SHOTS in the construction world, snapped around a conference table at the recent meeting of the Associated General Contractors in Denver, who handled

a sizable chunk of war construction during the last big scrap, are now directing their energies to the perplexing construction problems of today. In case you don't already

know them, meet (left to right) WARREN S. BELLOW, president of the A.G.C. and head of the W. S. Bellows Co., Houston, Tex.; STEVE BECHTEL, associated with numerous big West Coast firms; HERMAN BROWN, president of Brown & Root, Inc., Houston, who has a hand in several big dams now getting started; FORD TWAITS, head of Ford J. Twaits Co., Los Angeles, biggest West Coast builder; and LESTER ROGERS, president of Bates & Rogers Construction Corp., Chicago, one of the second generation of prominent A.G.C. officials.



*Cited
for
Service*

THREE STRIPES surmounting a broad gold band on the sleeves of Ben Moreell's uniform represent more than his recent promotion to the 4-star rank of full admiral in the U. S. Navy—they are a citation for service from a grateful nation, from an appreciative Navy, from an admiring engineering fraternity, and from a proud construction industry.

The public is grateful for his war service as an outstanding Naval officer and for the manner in which he operated strike-bound oil industries and coal mines as a special representative of the President. His direction of the Bureau of Yards and Docks during the war and activities of his Seabees were greatly appreciated by the Navy. Engineers admire his practical approach to complex design problems in concrete, for he has contributed much to the advancement of concrete design. Construction men are proud to include Ben Moreell as one of them because of his fearless, fair and energetic handling of huge Navy war contracts and because he called upon construction for the organization of the famous Seabees.

Through sheer ability and devotion to duty Moreell has risen to the top in the Navy as the first staff officer to become full admiral and the first officer not graduating from Annapolis to achieve 4 stars. In his new job as Chief, Materials Division, Office of Assistant Secretary of the Navy, he has stepped out of and above straight engineering and construction, but he still wears the crossed oak-spray insignia of the Civil Engineer Corps on his sleeves.



ADMIRAL BEN MOREELL

Born in Salt Lake City 54 years ago, the admiral spent most of his youth in St. Louis, graduating in civil engineering at Washington University in that city in 1913. Four years later he joined the Navy, and for the next 20 years he served the Bureau of Yards and Docks as engineer and Public Works Officer at various stations.

In December, 1937, Moreell was appointed Chief, Bureau of Yards and Docks and Chief of Civil Engineers, a job he held throughout the war. In 1943 he received The Moles' Construction Award.

Organization of the Naval Construction Battalions, popularly known as the Seabees, was perhaps

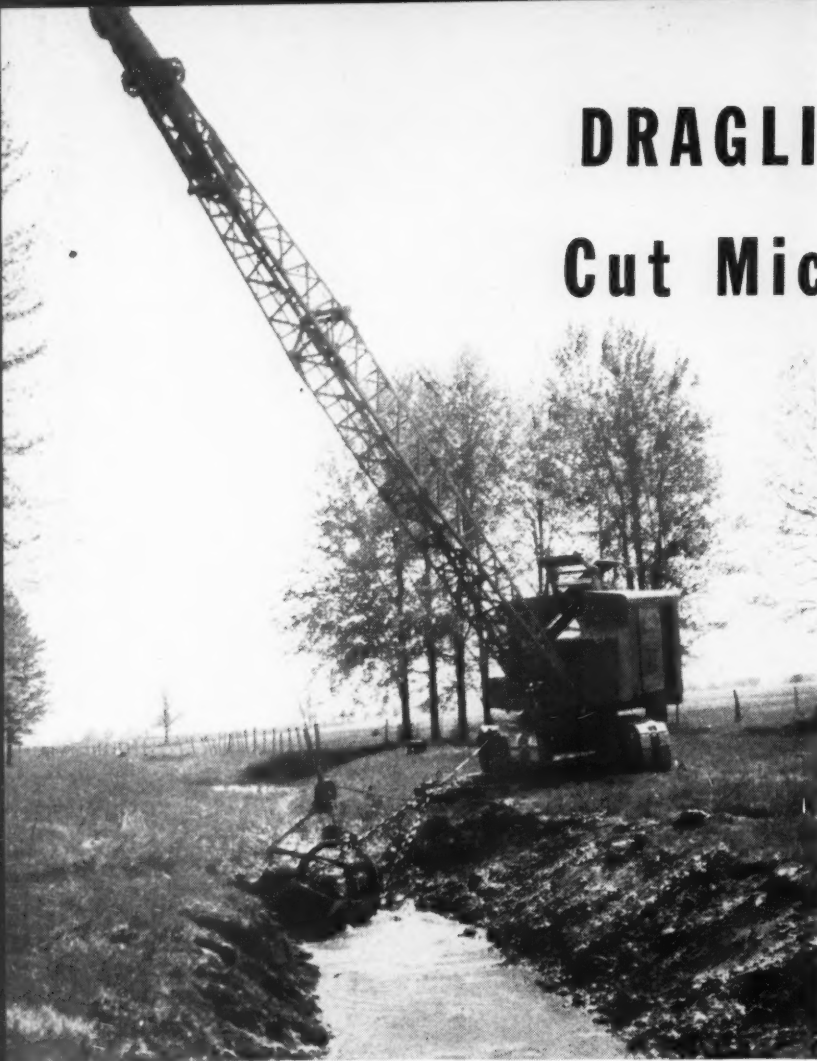
his greatest contribution to the war effort. Staffed largely by construction men, these intrepid battalions spearheaded many an attack against South Pacific islands.

Scientist, engineer, administrator, organizer and leader of men, Ben Moreell is beloved by all who know him. Big in stature, he can be as tough as he looks if necessary. Yet, that huge frame carries a great big soft heart that generates sympathy, understanding and compassion.

His personality, ability, leadership and integrity have endeared him to all. Leigh Hunt's immortal wish for Abou ben Adhem: "May his tribe increase," is also the nation's wish for Admiral Ben Moreell.

DRAGLINES AND BACKHOES

Cut Michigan Drain Ditches



DRAGLINE enlarges old Michigan drain ditch to 5-ft. bottom width at rate of 1 mi. per week on Walraven Bros. job.

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WALRAVEN BROS., FRANK J. and WM. A. (left and right) inspect one of their drain jobs with ART REIDINGER, sales manager for Bay City Shovels, Inc.

TEAMS AND SLIP SCRAPERS corrugated the flat Saginaw Valley in northern Michigan with drain ditches years ago when the lumberjacks moved out of the exhausted timberlands and farmers moved in to till the rich soil. Today many of those same ditches are being cleaned, enlarged and supplemented by a systematic construction program in which modern diesel draglines and backhoes dig ten times as much drain in a day as the horse-drawn scrapers did in a week.

All work is done by contract under local drain districts which have the power to issue drain notes to be paid off by assessments against benefitted property. The contractors are paid off in these interest-bearing notes, which can be discounted at local banks if desired.

Ditches vary in width from 5-ft. bottom upward. Side slopes are cut to angle of repose for the material, and, of course, the depth varies with the land contours. Specifications require spoil to be hauled away only if side casting interferes with roads or structures, otherwise the excavated material is cast and left along one side of the ditch. Most farmers, however, make supplemental deals with the contractors to bulldoze and spread the spoil into adjacent fields. Regardless of size of cut, all jobs are bid by the rod following an old custom.

WHERE DRAGLINE couldn't dig hardpan bottom (below), Walraven put backhoe on job and sailed right along.



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Contractors find $\frac{3}{4}$ -yd. to $1\frac{1}{4}$ -yd. draglines best suited to the ditching. From on top along one side, draglines can work the ditch from an angle to good advantage, leaving a straight, neatly trimmed cut behind. Sometimes on soft banks mats must be used under the machines. Because the rigs often work through fields and woods inaccessible by truck, extra fuel tanks are carried to keep the machines going a week, if necessary.

Typical Mechanized Operations

Several projects handled by two contractors, Walraven Bros. of Bay City, and Otto Taylor & Son, Saginaw, are typical of the mechanized operations. On one 8-mi. job Walraven is using a Bay City Model 62 dragline, equipped with a 50-ft. boom and 38-cu. ft. perforated dragline bucket. Here, on a 5-ft. bottom cut enlargement job, averaging 6 ft. deep, he is making 1 mi. per 6-day week with the one machine. On another ditch, known as South Gate of Wisner Drain in Tuscola County, he found a 24-in. hardpan bottom too tough to cut with a dragline, so he tried a Bay City $\frac{3}{4}$ -yd. backhoe, having a cutting radius of 31 ft., with good results.

On another job Otto Taylor & Son are straightening and enlarging an old small ditch into a young canal, 17 ft. deep, with a 20-ft. bottom width and 68-ft. top width. This project, $1\frac{1}{4}$ mi. long, runs into 177,000 cu. yd. of earthmoving. They are operating two Bay City draglines in tandem. A Model 45 with a $\frac{3}{4}$ -yd. bucket digs a pilot cut along



CULVERT IS BACKFILLED for access to farmyard, a common practice where drains follow close to road.

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BEFORE AND AFTER views (above and below) of Otto Taylor & Son's big drain project. Old, small ditch is being enlarged by cut running 100,000 cu. yd. per mi., excavated by two draglines in tandem. Forward machine cuts pilot ditch and one slope, second rig follows through on bottom cut and opposite slope.





DRAGLINES leave ditches straight and smooth, as shown by this view of typical Walraven work. Spoil cast on left side of ditch will be bulldozed over adjacent field.



FORMER SEABEE ROY TAYLOR, fresh from duty with 23rd NCB in Pacific, is running job for his father. He is shown here (left) with **ART REIDINGER** amid some heavy clearing.

one side of the finished ditch, followed closely by a Model 62 with a 1 1/4-yd. bucket working on the other bank. This last machine cuts out the bottom and the side opposite the pilot cut. Here, through non-tillable land, spoil is piled up on both sides.

Considerable clearing is required on Taylor's job. Large trees are felled, and then cut up for handling, with a Mall gas-driven chain saw. Stumps are blasted out. Lighter growth is torn out by the draglines, or else with bulldozers and winches.

Paul Bunyan, that master logger

who, it is said, made nearby Saginaw Bay when he stamped his foot in anger on the shores of Lake Huron, would be amazed at the goings on in his old bailiwick. These diesel draglines would be real competition for Babe, his famed and talented big blue ox.

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POWER SAW (below) cuts trees into handling lengths on Taylor's job. Stumps are blasted out later.



TIMBER-R-R. Big tree (below), cut down by power saw, topples over on Taylor's contract.



LEGAL ADVENTURES

of TRACTOR CONN

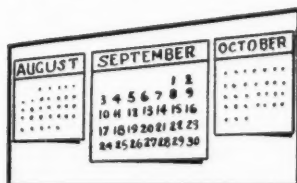


By LESLIE JOBB

No contractor ever tries to be his own dentist or his own shoemaker. It is even more dangerous for him to be his own lawyer. There are, however, some legal rules which every contractor should know, and these rules may be explained in plain English without resorting to the jargon of the law, unintelligible to most laymen.

This series of articles, dealing with the Legal Adventures of Tractor Conn, a typical contractor anywhere in the United States, explains some of these legal points in plain language for the contractor. Each one is based on an actual decision of an American Court.

The Case of a Late Completion



One of Tractor Conn's Illinois building contracts provided that the building should be completed on or before Sept. 1, that time should be of the essence of the contract, and that the architect's decision should be final and binding on both parties. The building was not finished till Oct. 1, when the architect gave a certificate that

the building was finished and that \$9,834 was due to Tractor Conn but without stating that the building had been completed on time.

Then the owner claimed damages for the delay.

"The architect didn't certify that the building was completed in time, so that does not bar me from claiming damages for the delay," the owner claimed and the Illinois courts ruled in his favor in 86 Illinois Law Reports, 49.

The Case of the Touchy Architect

"The architect wasn't on hand this morning, and he's taken his plans and specifications with him," Tractor Conn announced.

"He agreed to oversee the building and furnish the use of the plans till the job was done. I wonder what's wrong?" the owner queried.



"I'd say he's sore because you let the heating and plumbing to Montgomery and got Brown to draw the plans. Brown and he are deadly business rivals," Conn suggested.

"I won't knuckle down to him, but the building must be finished," the owner averred. "You go and coax him back on the job for 5 percent extra on the balance of the work, and I'll make it right with you."

The architect came back on these terms and the building was completed. The owner settled with Tractor Conn, but refused to pay the extra 5 percent.

"I'm well satisfied with the job, but I do begrudge that extra 5 percent. It was a plain hold-up," the owner complained.

"It seems to me that since he refused to do the work that he contracted to do, without any valid excuse, the promise isn't binding on you or me," Conn argued.

And the owner did not pay, as his lawyer told him that the Missouri courts (in Lingenfelder vs Wainwright, 103 Mo. 578) ruled against the architect on a similar state of facts.

More Legal Adventures of Tractor Conn Next Month

TRACTOR CONN AND HIS LEGAL PROBLEMS

Appear in Book Form

For more than two years—beginning in March, 1944—*Construction Methods* has been publishing every month under the head "Legal Adventures of Tractor Conn" discussions, in non-legalistic language, of court decisions involving typical controversies that arise in the business of contracting. So many of our readers have found these cases interesting and helpful that it has been decided to assemble the material

in book form for ready reference and guidance. The author of the new volume, titled "The Contractor's Legal Problems" is N. L. Hayward who, up to now, has been writing under the nom de plume of Leslie Jobb. The book, designed for the practical purpose of enabling the construction man to avoid costly legal pitfalls, is published by the McGraw-Hill Book Co., 330 West 42nd St., New York.—EDITOR.



LONG STEEL PILES are driven to rock of Back Bay section of Boston for foundation of new home office building of John Hancock Mutual Life Insurance Co. Piles are 14-in., 117-lb. H-sections from 89 to 120 ft. long. A total of about 1,600 piles will be driven to support the 26-story building covering an area 250 ft. square.

AT WELDING YARD, pile sections are held in roller jigs while sections are spliced. Mill furnishes some piles in 120-ft. lengths

but majority must be spliced. Jig assembly, capable of holding six piles, rotates pile to permit all downhand welding of splices.



PERSONNEL ON JOB includes (l. to r.): M. H. PARSONS, project manager for Turner Construction Co., which holds general contract for building; E. WHITELEY, superintendent for Raymond Concrete Pile Co., subcontractors on piling; R. C. PITCHER, job representative for the owners and the architects, Cram & Ferguson of Boston; R. B. HAZARD, Turner's superintendent.

LONG STEEL PILES

Spliced by Welding In Rotating Jigs

SUPPORTING PILES as long as 120 ft., are being driven for foundations of an addition to the present Home Office of the John Hancock Mutual Life Insurance Co. in Boston. Designed by Cram & Ferguson, Boston architects and engineers, the 26-story building will cover an area of 62,500 sq. ft. and will rest on 1,600 14-in., 117-lb. steel H-piles driven to rock through silt and clay. Only a few buildings in this area have foundations extending to rock.

Pile lengths that require splicing are welded in jigs that rotate the pile to permit downhand welding. Piles are trucked 4 mi. from the welding yard to the job site. Safety hooks on a lifting beam hold the piles securely during loading and unloading, while a shackle bolted through pile flanges prevents cable slippage as the long piles are lifted into the 128-ft. driver leads. Piles are driven with a Vulcan 00 hammer; and a steel beam follower, boxed with plates between flanges to permit easy withdrawal, puts the pile to grade 21 ft. below present excavation. An average of one pile

FINISH
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FINISHED SPLICE on 14-in. pile has 9½-in. square plates on one side of web and on each flange. Splice plates serve also as backing strips for full section welds, and corner points down to minimize driving resistance. Joint is beveled before welding.

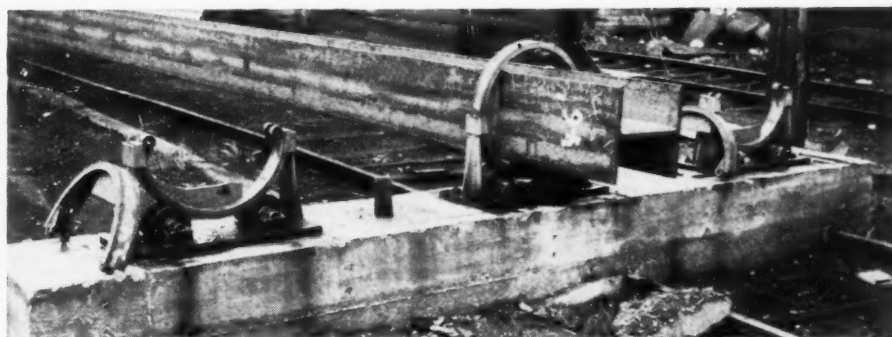


BRIDGE CRANE, in welding yard loads 110-ft. pile on to truck trailer for 4-mi. trip from Charlestown welding yard to job. Lifting beam, 40 ft. long, has four-point suspension from crane hook, with two end cables equipped with turnbuckles to equalize tension.

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per hour for a 110-ft. length is achieved by driving to excavation level for two-thirds of the day, then cabling the follower to the hammer, and driving all the previously started piles to grade.

General contractor for the building is Turner Construction Co. with M. H. Parsons project manager and R. B. Hazard superintendent. R. C. Pitcher is owner's and architect's representative, while E. Whiteley is superintendent for Raymond Concrete Pile Co., subcontractor for pile driving.



END OF PILE SECTION in welding jig will be scarfed before lengthening section, with splice plates attached, is butted to it for welding. Each splice takes about 2½ man hours to complete. Overhead crane easily spots piles in jig.

(Continued on next page)



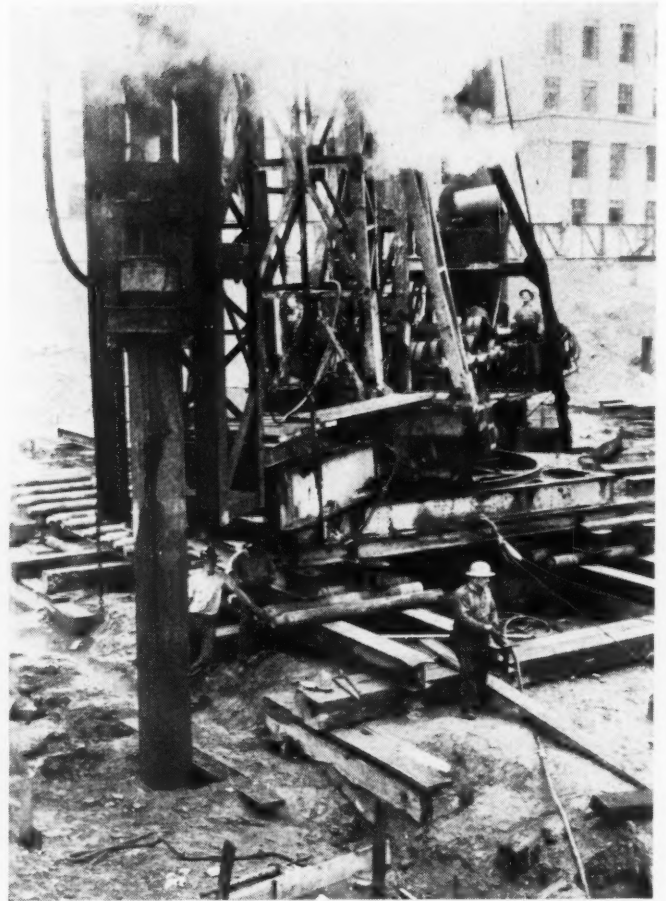
PILES ARE UNLOADED at job by 10-ton stiffleg. Low-bed gooseneck trailer, operated by C. E. Hall & Sons Inc., Somerville, Mass., carries load of 3 long piles through Boston's busy streets. Timber cribbing and two 55-ft. beam supports raise piles 13 ft. above roadway to clear most street traffic.

LONG STEEL PILES

...continued



PILE IS LIFTED into leads for driving through fill in what was once Boston's Back Bay. Universal pile rig with 128-ft. leads and 70-hp. boiler drives 14-in. 117-lb. H-sections with Vulcan 00 single acting hammer having 10,000-lb. ram and 40-in. stroke.

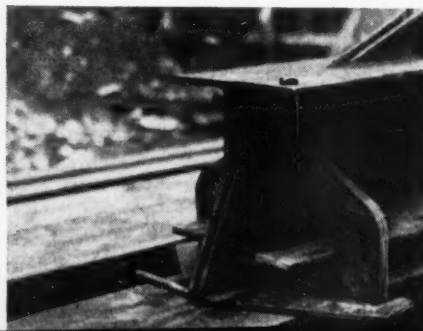


OPERATING PROCEDURE is to spend first two-thirds of day driving piles to excavation level and to finish by following them to grade, since 21 ft. of driving with follower takes about one-third of total driving time. Crew averages a pile an hour in driving 110-ft. lengths.



BOXED FOLLOWER 25 ft. long drives pile to rock with top of pile fetching up 21 ft. below present excavation. Follower is 14-in., 136-lb. rolled section with 3/4-in. thick plates welded between flanges to facilitate withdrawal from sticky ground. Cup made of 1 1/2-in. thick plate is welded to bottom of follower to hold it on pile. Follower, when in use, is cabled to pile hammer for ease in moving and spotting.

SAFETY HOOKS (below) on lifting beam hold pile securely during lifting. Pivoted dogs hook under pile flange by own weight and are kept from releasing by yoke plate pinned to strongback.



SPECIAL SHACKLE, used instead of cable choker, is bolted through flanges 30 ft. from top of pile and eliminates slippage while lifting pile into driver leads. Safety conscious contractor finds that attention to details pays off in improved worker efficiency.

DETOUR ROAD

Built to Carry Traffic
Around Texas Highway
Reconstruction Job



LOADING OF GRAVEL for resurfacing 6-mi. detour road is done with $\frac{3}{4}$ -cu. yd. Lima dragline discharging into 10-cu. yd. tractor-hauled Mississippi bottom-dump wagons.



ONE-WAY HAULS of as much as 11 mi. were made by tractor-hauled wagons operating at speeds of 20 mph. between gravel pit and site of detour road construction.

CONSTRUCTION OF A 6-MI. gravel-surfaced detour road to carry traffic around a state highway reconstruction, widening and paving project between Waco and Marlin, Tex., was an item included in a \$340,000 contract awarded to the H. E. Williams Co., of Waco. Grading and surfacing of the temporary detour road was completed before work was started on removing the bituminous surfacing on the 6-mi. length of main state highway prior to widening and resurfacing so that the traveling public suffered a minimum of inconvenience.

WINDROW OF GRAVEL (below) for surfacing detour road is dropped by bottom-dump wagon carrying 10-cu. yd. load.



Topping material for the detour road and the new roadbed was taken from a clay-gravel pit 5 mi. off the highway. About 78,000 cu. yd. of material were moved from the pit over a haul route averaging $8\frac{1}{2}$ mi. one way. The hauling was done with Mississippi wagons, of which the Williams company purchased ten for use on this and future jobs.

Using six Mississippi wagons while waiting for delivery on the other four, the contractors at the start of the gravel haul were moving 500 cu. yd. a day to the portion of the detour road farthest from the gravel pit—a one-way haul of about 11 mi. With loads of 10 cu. yd. or more, each wagon, hauled by a rubber-tired International tractor, has maintained an average travel speed for the round trip of better than 20 mph., according to the contractors' records. After completing the haulage of gravel for surfacing the detour road the fleet of 10 wagons was put to work on the main state highway reconstruction.

Other equipment used on the job included an Allis-Chalmers motor grader, a $\frac{3}{4}$ -yd. Lima dragline for loading the Mississippi wagons, four LeTourneau scrapers an Allis-Chalmers crawler tractor and grader, two pneumatic-tired rollers, two sheepfoot rollers, a 34-E Koehring concrete mixer, subgraders, finishing machines, mechanical spreader, longitudinal float, water trucks and clamshell bucket.

The 6-mi. stretch of widened and repaved highway will provide the final link of 24-ft. wide concrete pavement on State Highway No. 6.

Home-Building Industry

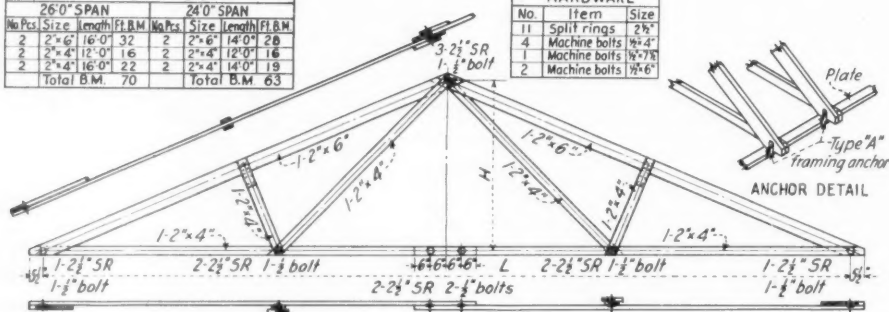
A NEW TYPE of trussed rafter designed to save up to 400 ft. of lumber in a 2-bedroom house is now being used extensively in veteran's houses under construction, according to the Timber Engineering Co., Washington, D. C., developer of the design.

By the use of these rafters lumber can be saved by eliminating heavy bearing partitions and using non-bearing partitions such as light studs. There is less waste by pre-cutting and the ridge board is eliminated.

Rafters preassembled on the ground are erected as a unit, thus

LUMBER LIST											
26'0" SPAN						24'0" SPAN					
No	Pcs	Size	length	Ft.	B.M.	No	Pcs	Size	length	Ft.	B.M.
2		2"x6"	16'0"	32		2		2"x6"	14'0"	28	
2		2"x4"	12'0"	16		2		2"x4"	12'0"	16	
2		2"x4"	16'0"	22		2		2"x4"	14'0"	19	
Total B.M.					70	Total B.M.					63

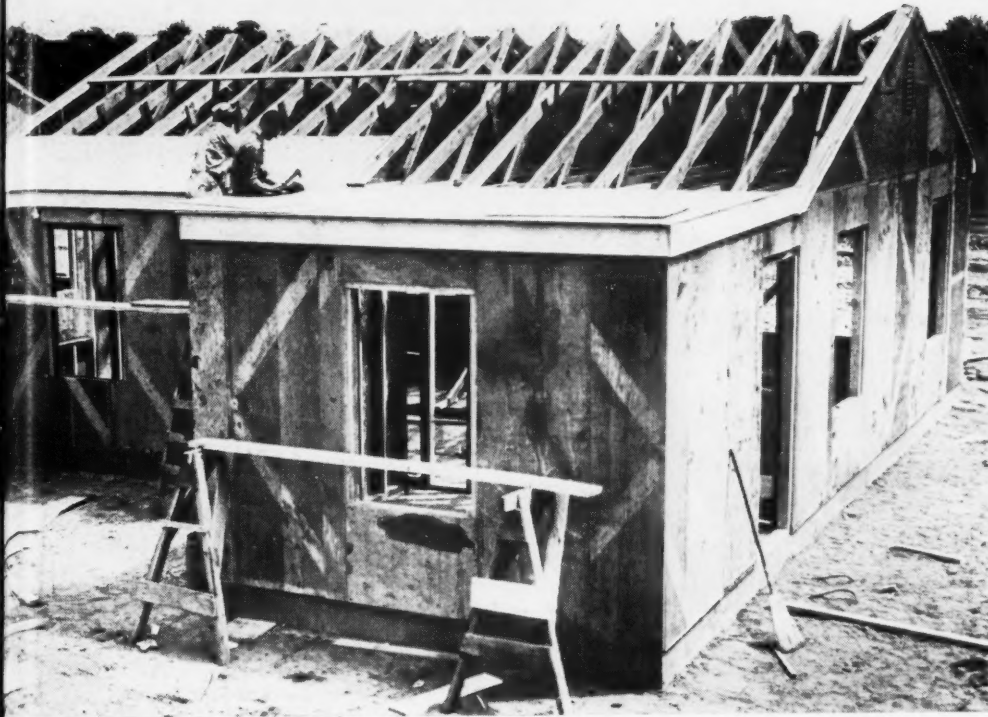
HARDWARE		
No.	Item	Size
11	Split rings	2½"
4	Machine bolts	½" 4"
1	Machine bolts	½" 7½"
2	Machine bolts	½" 6"



DESIGN DETAILS of trussed rafter and lists of materials required.

ASSEMBLY (below) of precut rafter members from stockpile and layout for side wall of low-cost house are done at job site.





FOURTEEN TRUSSED RAFTERS form roof structure for five-room, 24x30-ft. house. Each rafter is fabricated with aid of 11 Teco split-ring connectors.

making possible faster erection and affording interiors quicker protection from weather. A movable jig table means faster assembly. Rafters for one 4-room house can be assembled by 2 men in 1 hr. No shimming or fitting is necessary because of inaccurate hand framing.

With standardized exterior walls, roof and ceiling, any interior layout can be developed. The designer does not have to build rooms around

bearing partitions, as the partitions can be placed anywhere without regard to ceiling framing. This flexibility makes it possible to provide 3-, 4-, 5- or 6-room houses with the economy of standardized structural framework. Prefabricated storage wall units will increase storage space in small homes without the expense of on-the-job framing of closets. They form partitions but are moved into place after plastering.

WITH RAFTERS IN PLACE (below) sheathing is applied to complete roof. Gable ends are built into side walls with rafters spanning from wall to wall.



Contractor Problems Cited by F. W. Parrott

INCREASED COSTS and general uncertainties are not confined to highway construction, but are common to all business today, F. W. Parrott, vice-president of the Associated General Contractors of America, pointed out at a recent meeting of the joint cooperative committee of the American Association of State Highway Officials and the A.G.C., held in Salt Lake City, Utah. The meeting was held in conjunction with the Western Association of State Highway Of-



F. W. PARROTT

ficials to study special problems confronting the big highway construction program. Mr. Parrott, in speaking before the committee, made the following points:

(1) With respect to the complaint that contractors have in many instances hired engineers away from state highway departments, it is also true that contractors frequently hire men away from other contractors. Mr. Parrott said that the policy of his firm in this respect is first to approach the man's superior before hiring him. Invariably the superior's attitude was not to stand in the way of the employee's getting a better job. The solution for the state highway departments is to pay their engineers enough to

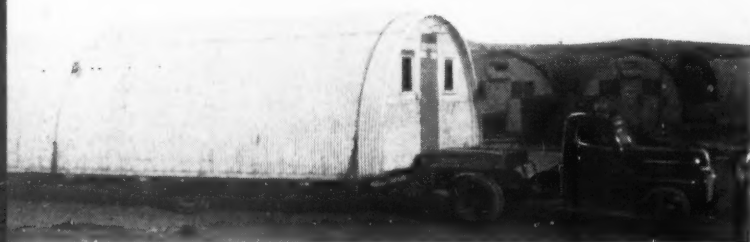
(Continued on page 165)



SHORTAGE OF FORM LUMBER forces Daniel O'Connell's Sons, Inc., Holyoke, Mass., to line sidewalk forms with building paper during construction of bridge over Westfield River near Agawam, Mass. Paper keeps concrete from flowing through holes in much-used form material and through cracks caused by shrinkage of green lumber.



NO HEAVY MANUAL WORK in lifting gas cylinders on to delivery truck is needed with this elevating platform body manufactured by Dempster Brothers, Inc., Knoxville, Tenn. Mounted on Mack truck, platform has open grate floor for weight saving, cleanliness and safety. Vertical telescoping hydraulic piston raises yoke and platform, after which assembly is pulled forward on to truck frame by winch and cable. In discharging load, horizontal piston pushes platform to rear of truck where it is lowered by vertical ram.



SURPLUS QUONSET HUTS are trucked intact from Navy training center to veterans' homesites to provide emergency housing. For moving 16x36-ft. units, H. Macdonald Co., Newport, R. I., loads them on Ford-drawn, 15-ton LaCrosse trailer and reinforces overhanging rear of hut with steel beams. For hauls of more than 15 miles, hut's front panel and 6-ft. section of floor are removed and dwelling is moved up over trailer gooseneck. Total of 44 Quonset units was moved at rate of three per day.

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AUXILIARY DIESEL FUEL TANKS fastened above counterweights on Bay City draglines enable rigs to work week at a time on inaccessible Michigan drainage jobs without refueling. Walraven Bros., Bay City, built 350-gal. all-welded streamline tank (below, left) for their machine, while Otto Taylor & Son, Saginaw, mounted two steel drums (below, right) on back of dragline for spare fuel supply.

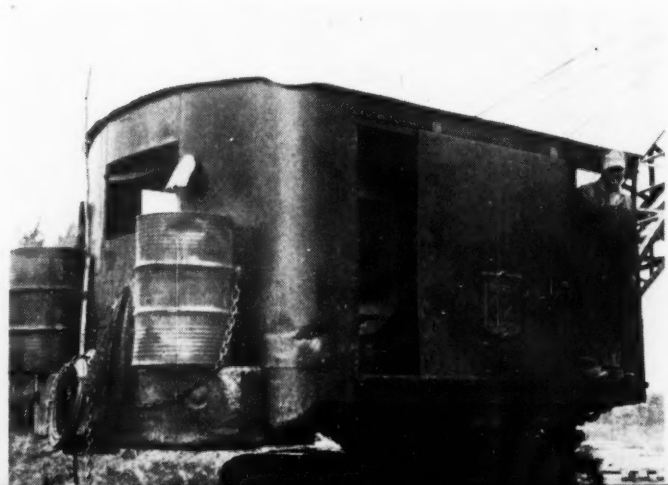


HOW

They Did It

CONSTRUCTION DETAILS

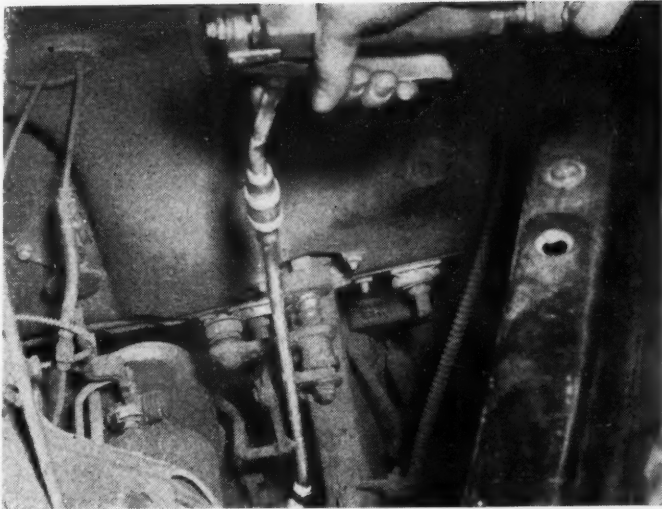
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OUT-OF-WAY FITTINGS are made easily accessible by use of adapters in lubrication jobs. These tools also make work cleaner and help prevent bruises.

Shell Oil Photo



TWO-WAY NARROW-GAGE RAILROAD DUMP CARS, once very popular in this country, place concrete from high trestle for walls of pump house in huge Volta Redonda steel plant in Brazil.

CAST-IRON PIPE COLUMNS projecting above roof of Algiers clearwater reservoir, New Orleans, support precast concrete roof slabs on pins inserted through cast-iron sleeves embedded in slabs. Built by Boh Bros. Construction Co., New Orleans, to design by New Orleans Sewerage & Water Board, roof construction permits future adjustment of roof slabs to take care of any uneven settlement of structure, thus preventing ponding of rainwater which might contaminate drinking water inside reservoir. Columns will be covered with cast-iron caps.



RELAY RAIL is cropped by Airco portable machine (below) with three-point contact which automatically positions it for making square cut. Two oxyacetylene torches are joined by 5/16-in. hose with tee connections. First cut is made across ball of rail and half way down web, while second is made across bottom of rail and up through web to meet first cut.

ELEVATING BOOM PAVER (below), a Foote 34-E, dumps concrete direct into chutes for placing footing concrete on Peter Hamlin Construction Co. job for R. R. Donnelley & Sons Co. new printing plant in Chicago. This rig, through special brake, clutch and hoist assembly, can lift 1 1/4-yd. batches as high as 18-ft. clearance under bucket. L. J. Wysocky, superintendent for Hamlin, is filling 15 footings from 12 to 16 cu. yd. each per 6-hr. shift.

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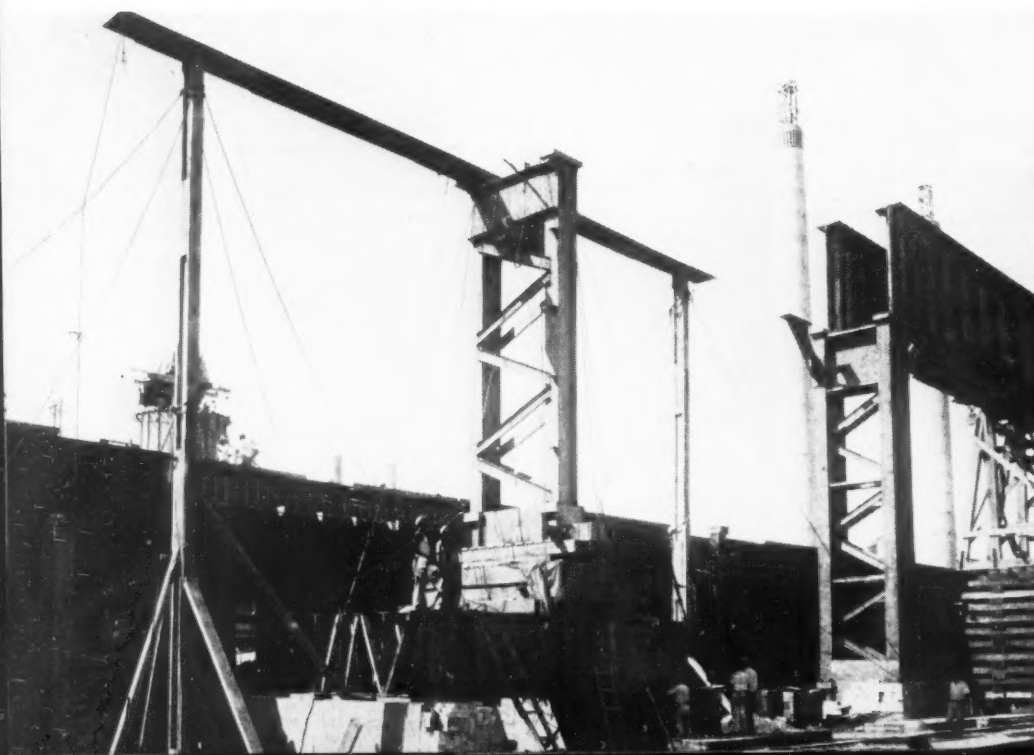


STIFF LEG ON TRAVELER (left) erects roof steel for Brazil's big steel plant at Volta Redonda. Large girder (center), is 12 ft. deep with 3-ft.-wide cover plate. Minimum clearance of 15x11 ft. in 16 tunnels on 76-mi. railroad through mountains made it necessary to transport girders on special dollies made from pony trucks of locomotive.

Improvised

ERECTS HEAVY STEEL

TEMPORARY SUPPORT at center of girder span (below) consists of guyed steel column resting on sand box supported by girder grillage. Bottom cover plate shown supported on columns is centered and cambered before girder is erected. Note timber-bent tower (right), resting on timber cribbing, that is sometimes used for girder falsework.



ANOTHER MONUMENT to inter-American cooperation has been brought to successful completion with the opening of Brazil's big steel plant at Volta Redonda. Having a rated yearly capacity of 350,000 metric tons, the plant was designed and fabricated in the United States for the National Steel Co. of Brazil and was erected by native labor under the direction of American and Brazilian top personnel. Much of the erection equipment was made on the job, and an intensive training program transformed unskilled workmen into efficient erection crews.

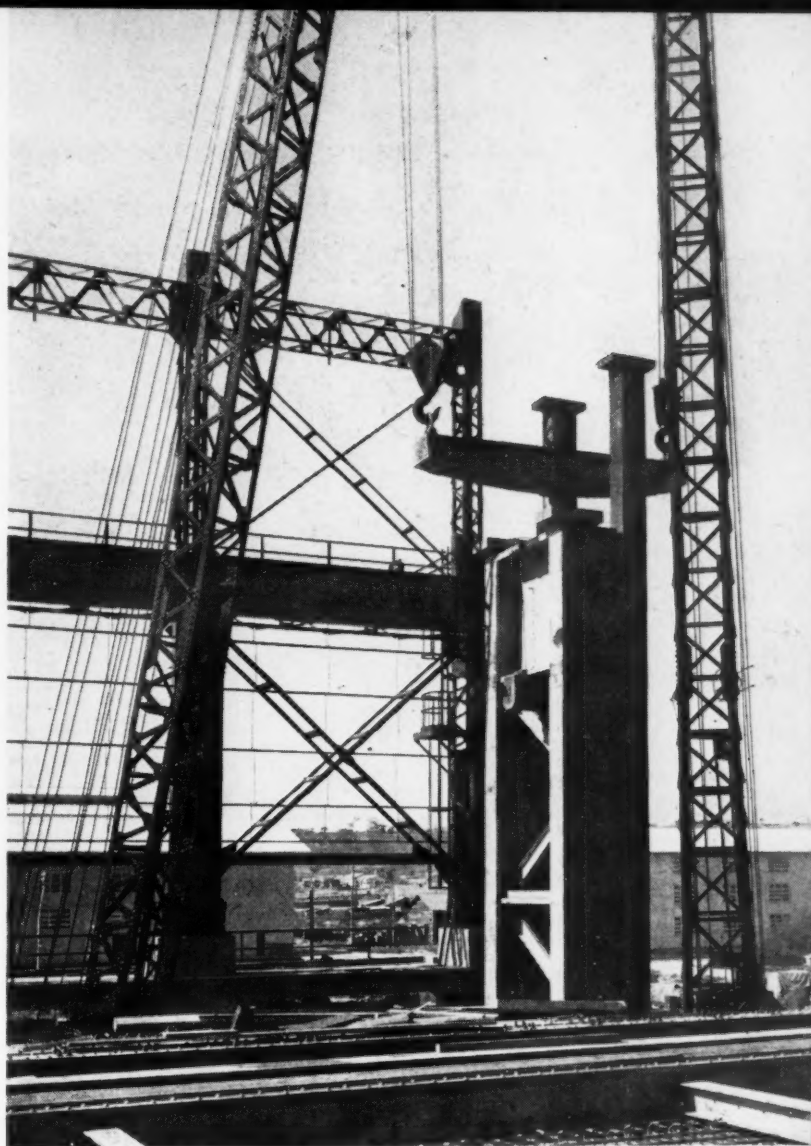
Transportation of material from Rio de Janeiro to Volta Redonda—the last stage in the 8,000-mi. trip

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from the United States—was over a 76-mi. railroad passing through 16 tunnels and over a mountain range at an elevation of 3,800 ft. Trains were limited to a maximum of 12 cars, and 675 train loads were required to transport 168,000 tons of steel and equipment for the completely integrated steel plant. A minimum tunnel clearance of 15x11 ft. further aggravated the transportation problem. Weighing a ton a foot, 54-ft. half-girders 12 ft. deep, with 3-ft. wide top cover plates, were freighted on a special dolly made from the pony trucks of a locomotive. Eighteen of these girders were moved over the mountain one at a time, with a transit time of from 10 to 36 hr. per girder.

Since the available cranes were incapable of handling the entire 108-ton, 108-ft. girders, the half-girders were spliced after erection. Temporary falsework at the center of the span supported the girder halves during splicing. The temporary supports were either two timber-frame bents spaced about 12 ft. apart and cross braced to form a tower, or a single guyed steel column bent resting on a sand box supported by a grillage of short girders. The bottom cover plates of the heavy girders had been shipped separately and it was necessary to center and camber these before erecting the girders. The cover plate assemblies, which weighed from 6½ to 9 tons, were supported at their centers by the girder falsework, and at the ends by guyed posts made of 3x9-in. timbers.

Two 50-ton locomotive cranes lifted each half-girder



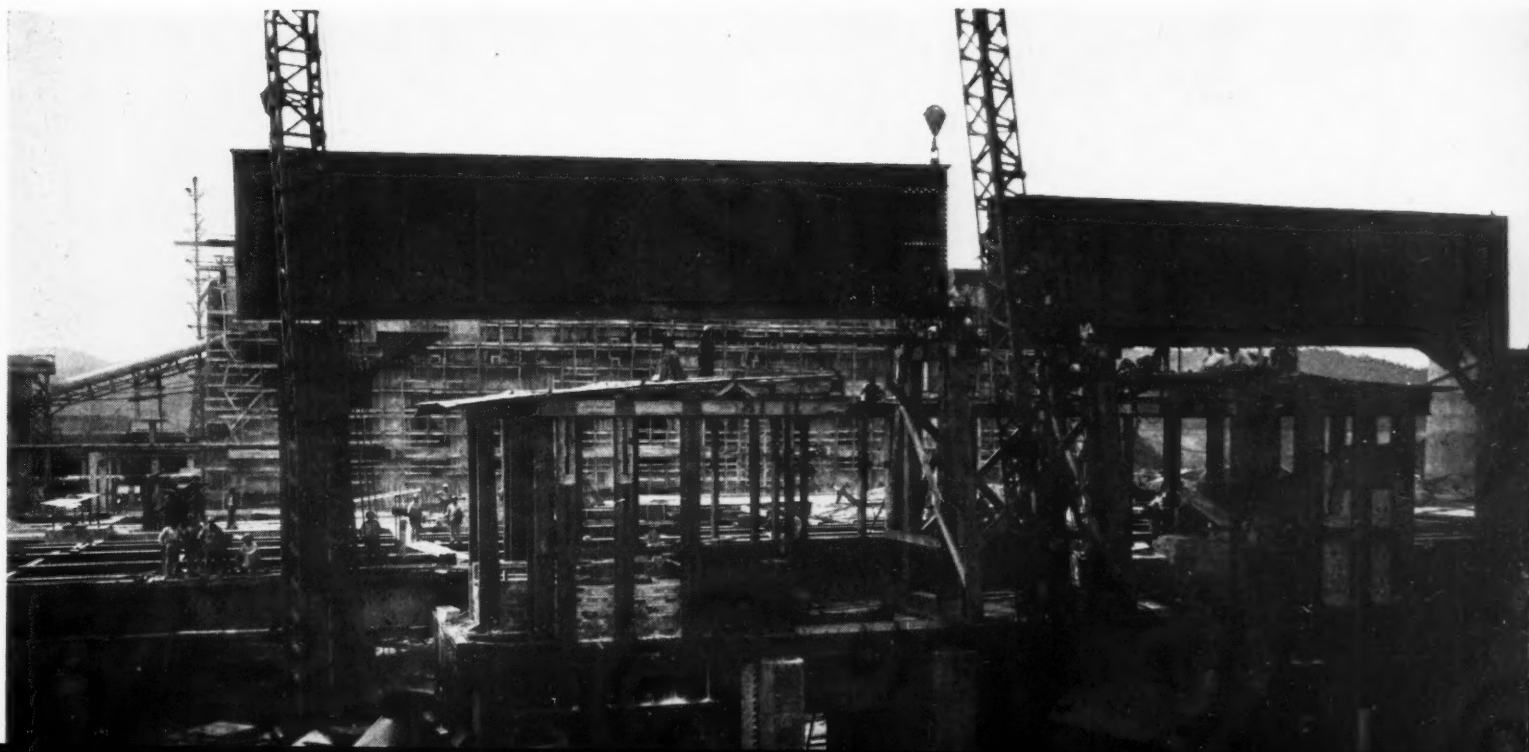
BALANCE BEAM made from old bridge crane is used to set 49-ton column. Where drift is short, rigs hitch to 14x14-in. timber shown wedged in column. Timber is curved and faced with steel plate to take two 1¼-in. chokers.

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Equipment

FOR BRAZIL MILL

GIRDER-HALF (below). 54 ft. long and weighing a ton a foot, is raised by two 50-ton locomotive cranes. Timber-bent frame supports center of girder and bottom coverplate. Splice and cover plates will be completely bolted and girder checked for correct camber before rivets are driven.





STEEL IS STRAIGHTENED after being damaged during 8,000-mi. trip from United States to Brazil. One crew worked continually for eight months to straighten bent material of 168,000-ton equipment and steel shipment.

to its supports, after which the splice and cover plates were drift-pinned and bolted. The entire girder was checked for correct camber, and all rivets were driven before the false-work was removed. Columns weighing 49 tons were erected by two 50-ton rigs using a balance beam made from an old bridge crane. The beam hooked on to the top of column, but where drift was short and the hitch had to be lowered, a 14x14-in. tim-

ber, wedged through the column lattice and faced with steel plate curved to take two 1¼-in. chokers, was used.

The open-hearth roof, with monitor ridge 127½ ft. above the charging floor, was erected with a 100-ft. boom, 30-ton stiffleg derrick mounted on a traveler. The traveler consisted of a 60-ft. tower of 14x14-in. timbers mounted on two 70-ton flat cars ballasted with ingot molds. All

loose steel arriving at the job was assembled in the plant's mold yard and was matchmarked and stored until erection. One entire crew was kept busy for eight months straightening and remarking steel that had been bent and damaged in shipment. The remoteness of supplies made necessary the site-fabrication of much of the equipment used. Small tools such as wrenches, dolly bars, shackles and drift pins were made in the project's forge and machine shops, and even 8x8x1-in. angles for girder hitches were welded from ½-in. plates.

A night school was conducted two nights a week for six months, where all erection workers—including foremen, bridgemen, riveters, crane operators, and pushers—were taught to tie knots; reeve block and falls; heat, catch, drive and buck rivets; climb columns and bolt steel; block a crane and give proper hand signals. Erection of 25,000 tons of steel with few minor mishaps and no fatal accidents indicates the success of the training program carried out by this organization.

Information and photographs for this article were furnished by J. B. Gibson of the erection department, Bethlehem Steel Co., which supplied much of the structural steel for the project. Col. Macedo Soares e Silva was technical director of the works until his recent appointment as Minister of Communications and Public Works of Brazil. He has been succeeded by Paulo Martins.

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STEEL ASSEMBLY is speeded with overhead crane of plant's mold yard (below). All assembly and erection crews, including foremen, are native workers trained in six-month course at project's night school. Steel plant, with rated yearly capacity of 350,000 metric tons was designed and fabricated in United States.



SCRAPERS Fill Overpass Ramp in Fast Time



ROCK TOES hold slope as four Terra-Cobra scrapers place fill for bridge approach in fast time on California highway.

EARTHFILL for an overpass ramp on California's new Bayshore Freeway south of San Francisco was placed in a hurry by four Wooldrige Terra-Cobra scrapers. On a round-trip haul from 1,200 to 1,500 ft., the four 14-yd. rigs, carrying heaping loads up to 20 yd., completed the 1,500-cu. yd. fill in less than 4 hr. from a nearby borrow pit.

Key to the fast schedule was the arrangement of the scraper run on the fill, laid out in U-shape with the closed end (high point of fill) toward the proposed structure. Heavy rock, previously trucked in, defined and held the outer toe of slope on both sides of the roadway. Scrapers entered the fill at original grade at the open prong of the U nearest the borrow pit and worked up one leg and down the other, building the embankment up in successive lifts to finished grade of 4.2 percent.

A LeTourneau-equipped Caterpillar bulldozer worked the fill constantly, trimming the outer slopes and pushing part of the material in-



SCRAPERS followed U-shaped course around outside loop of embankment. Bulldozer worked dumped material to even grade and filled in center of ramp.

to the open center. The scrapers kept to the outside of the loop, which permitted uninterrupted travel. A small Allis-Chalmers tractor compacted the fill with a sheep-foot roller.

In the borrow pit scrapers were loaded with a Caterpillar push tractor that heaped the dirt high above

the bowl. Scrapers were loaded toward the fill, so they traveled in a figure 8 pattern through one complete cycle.

The fill is a small part of a million-dollar grading and paving contract held by N. M. Ball Sons, Berkeley, Cal. Sam Mattoon is construction superintendent.

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PUSH CAT loads scrapers heaping full in flat borrow pit alongside the fill.



Present and Accounted For...A PAGE OF PERSONALITIES



NAMED COMMISSIONER of West Virginia State Road Commission is **E. L. WORTHINGTON**, who has been affiliated with commission since 1922.



ELECTED PRESIDENT of Illinois Contractors Association is **FRED W. SHAPPERT, JR.**, head of Shappert Engineering Co., Belvidere.



ASSOCIATED GENERAL CONTRACTORS of Massachusetts has named **WILLIAM H. EDMONDS** as executive secretary. He was formerly administrative officer in OPA.



← **GENERAL SUPERINTENDENT** for construction of Wolf Creek Dam on Cumberland River in Kentucky is **H. V. APPEN**, vice-president of J. A. Jones Construction Co., Charlotte, N. C. Working jointly with Jones company on this \$18,500,000 flood control project is Wright Contracting Co., of Columbus, Ga. Work is under general supervision of U. S. Engineer Office at Nashville, Tenn.



→ **REGIONAL HOUSING EXPEDITER** for Ohio, Michigan, West Virginia and Kentucky is **C. STOTT NOBLE**, former regional manager of Home Owners' Loan Corp. and assistant administrator of Farm Security Administration. As representative of National Housing Agency, he will work with local government units, industry, labor, veteran and civic groups.



← **KORTES DAM** in Black Canyon of North Platte River, 60 miles southwest of Casper, Wyo., is being built by Morrison-Knudsen Co., of Boise, Idaho. M-K project manager for 240-ft. high dam is **B. "WOODY" WILLIAMS** (left), while **IRVIN J. MATTHEWS** is construction engineer for U. S. Bureau of Reclamation.



NEW ASSISTANT CHIEF of U. S. Public Roads Administration Bridge Division is **ERIC L. ERICKSON**, former bridge engineer for Atlanta, Ga., division of PRA.



Precisionbilt TO REDUCE DOWN-TIME
J&L WIRE ROPE
PERMASET PRE-FORMED

**J&L
STEEL**

When you are fighting for every yard of fill you can get you want to reduce down-time on your shovels to a minimum and keep those big trucks rolling until you hit pay dirt. The next time you replace a shovel rope—use J&L Precisionbilt Wire Rope. It is made of J&L Controlled Quality steel to give you longer service and help you cut down on costly delays. Our wire rope engineers will be glad to go over your equipment with you—check it for good rope practice. Write today.

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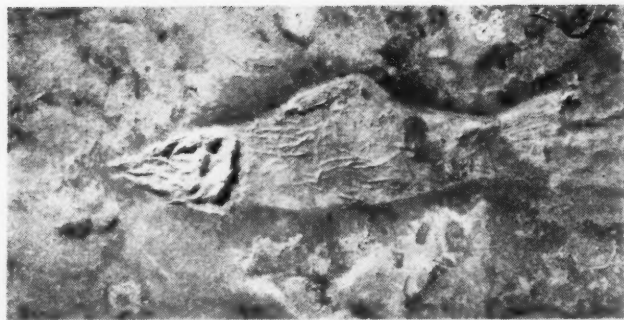
GILMORE WIRE ROPE DIVISION

PITTSBURGH 30, PENNSYLVANIA

J&L *Precisionbilt* PERMASET PRE-FORMED WIRE ROPE

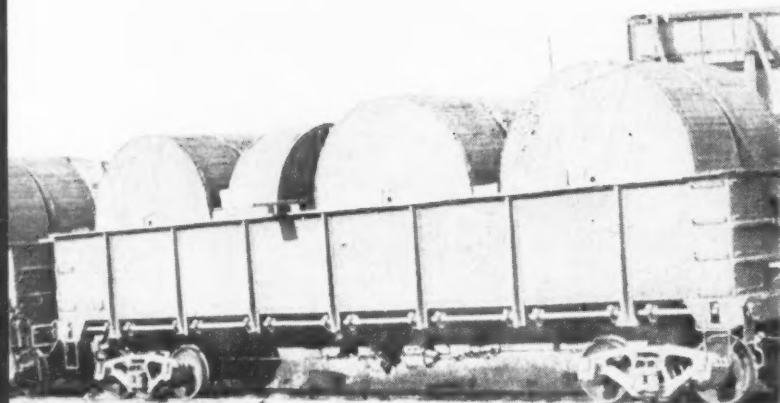


CROSSED CRANE BOOMS substitute for traditional crossed swords to form wedding arch for ceremony on Kwajalein Island, near Bikini in Marshalls, as Navy Nurse LIEUT. j.g. MARGARET SCULLY marries LIEUT. j.g. TIMOTHY O'LEARY. U. S. Navy Photo



FOSSIL FISH are discovered in excavation for Harvey S. Firestone Memorial Library at Princeton University. Several hundred specimens have been found in rock since Turner Construction Co. began work on \$3,500,000 building.

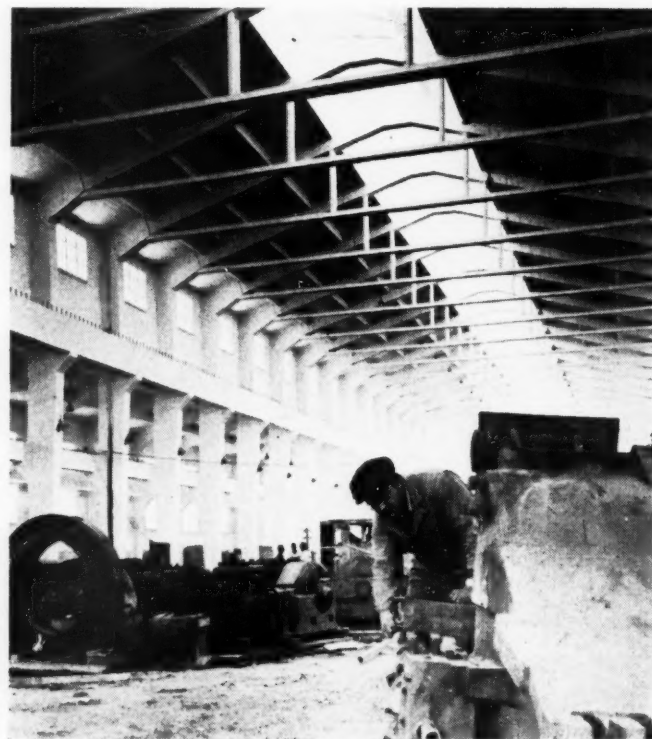
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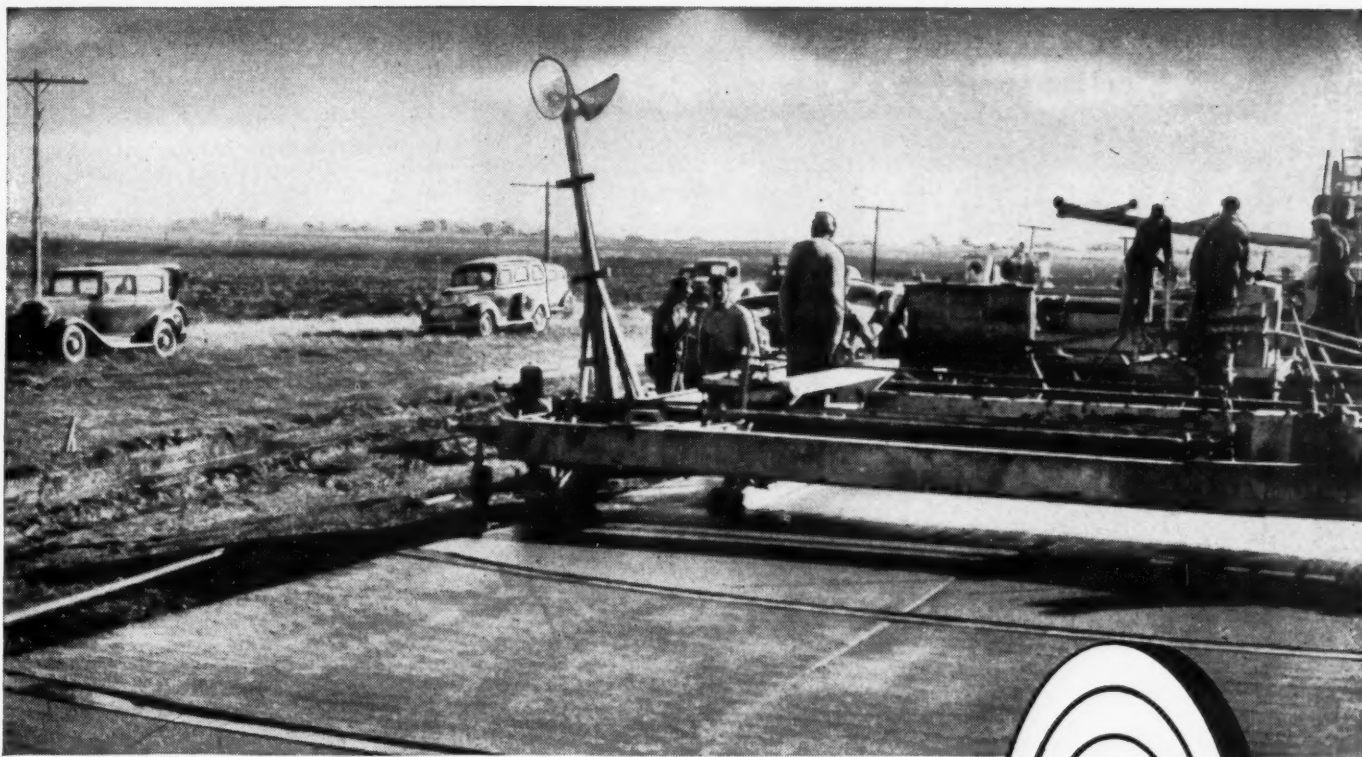


GOLD OR GRAVEL—it's all the same to conveyor belt which is on its way from Redding, Calif., to South Africa for use in gold mining operations. For 4 yr. this 36-in. Goodyear belting was part of 9.6-mi. conveyor system that carried 12,000,000 tons of aggregate for construction of Shasta Dam.

STEEL MILL largely built of reinforced concrete in Brazil reflects scarcity of structural steel, situation which big Volta Redonda steel plant is designed to correct. This is view of 130x770-ft. machine and boiler shop.

ELEPHANTS AID LUMBER INDUSTRY (below) in reconstruction of Moulmein in Burma. Here they heave logs into mills (top) and carry planks (bottom). British Combine Photo





M. P. Wynkoop, chief engineer; construction by Woodrich Construction Co., Minneapolis, operator for S. J. Groves and Sons, Minneapolis, contractors.

NORTH DAKOTA ENGINEERS . . .

NICK THE BULL'S-EYE OF AIR-ENTRAINMENT CONTROL!



THE TARGET: Entrained air, as measured by weight reduction of concrete, is specified by the North Dakota Highway Department to be within 3% to 6%. On a paving project west of Wahpeton, the engineers aimed at a concrete weight reduction of 4%.

THE SHOT: Prior to paving operations, weight of concrete without entrained air was determined by batch tests made with regular cement. The resulting weight was the basis for measuring the weight reduction of the air-entrained concrete. A cement interground with the precise amount of air-entraining agent needed for satisfactory field perform-

ance was insured by the use of Atlas Duraplastic.

THE HIT: Throughout the job, concrete weight reduction was constantly checked. At the end of the run, the tests revealed an overall average weight reduction of 3.6% . . . or only 0.4% off the target of weight reduction as a measure of entrained air!

THE DETAILS: An article describing the above job in detail will be sent upon request. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Bldg., New York 17, N. Y.

OFFICES: New York, Chicago, Philadelphia, Boston, Albany, Pittsburgh, Cleveland, Minneapolis, Duluth, St. Louis, Kansas City, Des Moines, Birmingham, Waco.

CM-D-34

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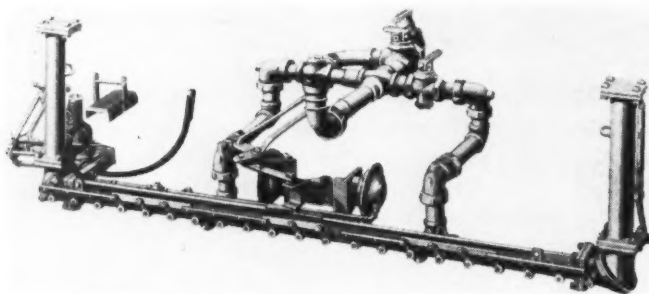
CONSTRUCTION EQUIPMENT NEWS

AUGUST 1946 REVIEW of Construction Machinery and Materials



CRUSHING AND SCREENING PLANT—First in new line of portable semi-electric powered duplex crushing and screening plants is No. 46-VE. Screen and conveyors are driven by electric motors from power supplied by diesel electric plant. Roll crusher is driven by V-belts from jaw crusher, which in turn is driven by flat belt to diesel motor. Clutch provides for starting and stopping crusher without interrupting diesel drive to generator. Operating height is 14½ ft. and screen can be hydraulically lowered so overall height in transit is only 12½ ft. Moving weight is 64,000 lb. Low-angle type, 3½-deck,

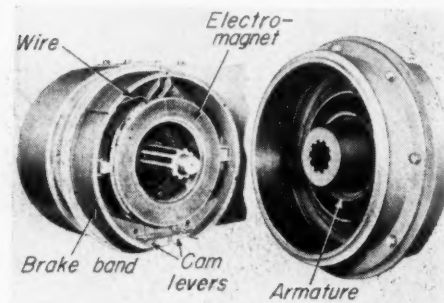
4x12-ft. screen is used with 1036 jaw crusher and 40x22-in. roll crusher. All main bearings are of friction type. Plant is mounted on main truck supported on three axles with equalizer between two rear axles. Pneumatic tires are standard equipment. Electric motors are totally inclosed, fan cooled, 220 v. Those on feeder and delivery conveyors are high torque, gear-head type. Feeder and delivery conveyors are mounted on hydraulic cradle-type trucks and are portable. Winches and worm gears are eliminated.—**Pioneer Engineering Works, 1515 Central Ave., Minneapolis 13, Minn.**



HOT SPRAY BAR for distribution of bituminous materials is of double construction. Material enters inner pipe which carries it to very ends of bar, from which points it circulates back through entire length of outer pipe and on out spray

nozzles or back into supply tank. Circulation of material is under positive pressure at all times from rotary positive pump. Maker claims it never needs to have torch applied to it or to be flushed into ditch to see that nozzles are all functioning. Full circulation is made possible by patented joint construction where end sections of joint have cone-shaped metal-to-metal contact which permits two end sections to swing from vertical to horizontal position without interfering with circulation. End sections are said to swing free if they hit solid obstruction from front or rear. Valves are located in spray nozzles to give instantaneous "full-on" or "shut-off" control without drip. Can be attached to a distributor and is available in several different lengths.—**The Cartwright Asphalt Equipment Co., North Robinson, Ohio.**

ELECTRIC BRAKE is installed on model AD heavy-duty motor grader to bring it to easy stop with little effort on part of operator. This marks first application of electric braking to construction equipment. Brake, extremely simple and foolproof, consists of electro-magnet working against steel plate armature within brake assembly. Application of electric current causes magnet to rotate slightly, thus expanding conventional

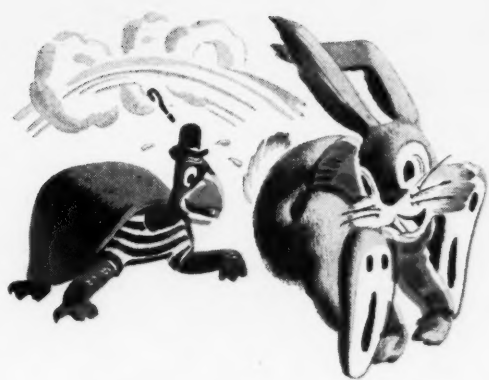


brake band against drum. Slight current for operation is furnished by same battery that supplies lights and is controlled by depression of regular brake pedal. Acting as rheostat, the more pedal is depressed, the more current is supplied with resulting increase in braking power. Pedal works against adjustable spring whose tension can be changed to suit operator. One wire leading to each brake drum replaces all former mechanical links and hydraulic lines and connections. No brake adjustment is required during life of brake lining as mechanism automatically takes up for wear. When lining wears down to rivet heads positive stop prevents further operation with resulting scoring of drum. Electric brakes work equally well in forward or reverse motion of grader and can bring machine to gentle or sliding stop at will of operator.—**Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee, Wis.**

PLASTIC SLIDE RULES—Plexiglas is now used for making minutely calibrated slide rules, which are said to defy temperature changes, humidity and other factors which affect wooden devices. New 10-in. slide



rule, developed by Pereles Bros. of Milwaukee, Wis., is now available for use by engineers, architects and contractors. Calibrations are molded in during manufacture, assuring long life and accuracy.—**Rohm & Haas Co., Philadelphia, Pa.**



*faster action
with ADAMS
motor graders*



Picture shows an Adams Motor Grader finishing a new road. Adams conveniently located cab controls enabled operator to get all blade positions required for bank sloping, ditching and surface work—without leaving cab to make mechanical adjustments.

● When you buy an Adams Motor Grader you get action—*fast action* . . . the kind that pays big dividends in time and money. For example:

Adams' Push-Button Starting starts the big Diesel engines, quickly, easily—gets grader going without loss of time.

Adams' Fast Transport Speed—up to 21 mph—gets grader to the job faster . . . means more time on the job—*at work*.

Adams' Power-Operated Blade Controls move the blade at fast constant speeds to virtually all desired positions—*without costly,*

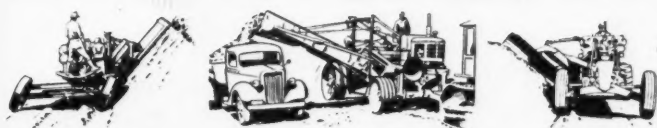
time-wasting stops for mechanical adjustments.

Adams' 8 Overlapping Forward Speeds instantly provide fastest practical speed for every grading operation.

Adams' Positive Mechanical Steering assures fast, safe directional control—at *all times, at all speeds.*

In every phase of design and construction, you'll find Adams Motor Graders built to deliver faster, smoother, more efficient operation—to *do more work, better, at lower cost.* See your local Adams dealer.

J. D. ADAMS MANUFACTURING CO., INDIANAPOLIS, IND.



ADAMS

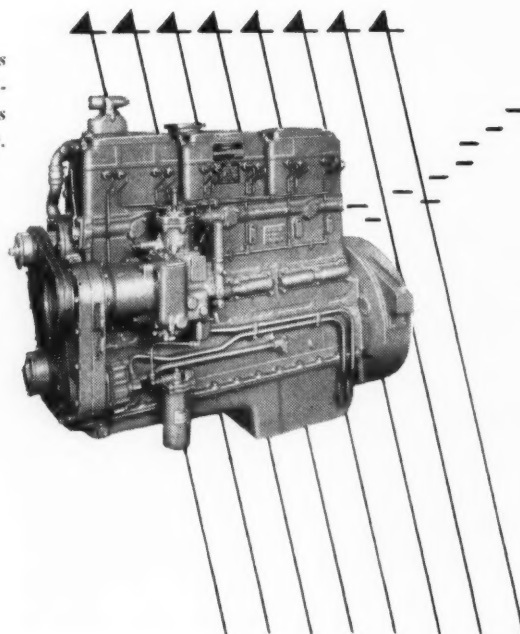
ROAD BUILDING AND
EARTH-MOVING EQUIPMENT



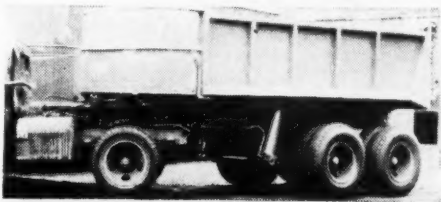
**A sound investment in power . . .
proved on countless jobs such as yours.***

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

** Ask your Cummins
Dealer to show you similar
working installations
in your own territory.*

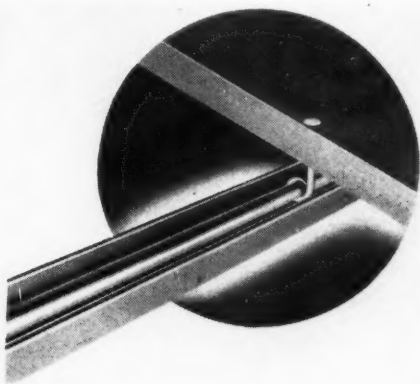


DUMP TRAILER—New dump trailer with 19-cu. yd. capacity can be used for hauling sand, gravel and other materials. Body dimensions are 18



ft. x 7 ft. 5 in. x 47½ in. Also available are models with 8½ and 15¼-cu. yd. capacity. — **Fruehauf Trailer Co., Detroit, Mich.**

STEEL NAILING CHANNELS — Speedy attachment and permanence in attaching tile, panels, slabs, acoustical and insulation sheets and other kinds of covering to steel are provided by Nailock channels. Spaced not more than 24 in. apart, they are set in concrete or attached to steel furring channels or structural steel



members by clips, wiring or spot welding and may be attached in vertical, horizontal or inverted positions. Special nails of different sizes and with varying shaped heads and rectangular, tapered shanks are supplied with channels. Unusually wide nailing course is afforded because distance between two edges of standard channels at widest point is nearly ¾ in.—**Sanymetal Products Co., Inc., 1705 Urbana Road, Cleveland 12, Ohio.**

SAFETY CHECK eliminates danger of wildly whipping compressed-air hoses by shutting off air immediately in event of excessive flow caused by accidental disconnecting or rupture in air line. Two main parts are housing and steel ball. Valve housing proper has female threads in both ends for attachment to compressor and air line. Ends are hexagonal in shape with steel ball resting between them in sump at compressor end. Numatic safety check is manufactured for working pressures up to 250 lb. and comes in standard ½- and ¾-in. sizes.—**Hackett Mfg. Co., Oakland, Calif.**

THE *INLAND* TUBE VULCANIZER

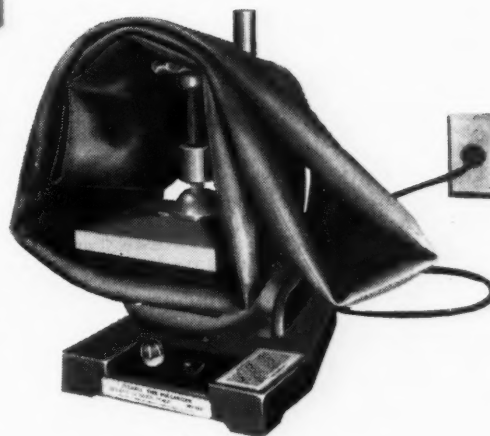
Failure-proof repairs in your own shop

No more trouble with synthetic tubes

Easy to operate

Handles all size tube injuries and valve stem repairs

For all size tubes



Now—in your own shop, you can turn out professionally perfect vulcanized repairs on truck and tractor tubes—of natural or synthetic rubber—that hold up under toughest operating conditions.

With the new Inland Vulcanizing Unit you can do a fast, thoroughly safe job. Repairs large breaks in 15 to 18 minutes. Handles injuries up to 6" long in one curing, on all

size tubes . . . plus all size valve stem repairs.

Inland Vulcanized tubes are ready to go back on the job with no delay. Eliminate waiting for tubes to be returned to your shop.

Complete Unit requires little space. An Inland Service Engineer will teach you the few simple operations for making repairs that last the life of the tube. Your automotive jobber has these units in stock now.

Complete Tube Vulcanizing Shop in this one unit—includes Inland's famous thermostatically controlled vulcanizing press, plus a complete stock of gum, vulcanizing cement, accessories and tools.

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Dept. C68, Chicago 3, Ill.

Please send me complete information concerning the Inland Tube Vulcanizing Unit.

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Address.....

Town.....



Red Lead is ALWAYS Pb_3O_4 ...that's why it's a Dependable Metal Paint

Industry has yet to discover a better metal protective paint than Red Lead. This is due to inherent fundamental properties of the pigment itself.

Among the most important of these are Red Lead's definite chemical composition and its purity, as distinguished from pigments that have indefinite composition or vary from batch to batch, with resulting possibility of variation in performance.

The reason for this uniformity is that red lead is a simple chemical compound—a combination of only two elements, oxygen and high-purity metallic lead. It is also an extremely pure compound, containing no corrosion accelerating impurities such as water-soluble chlorides or sulfates.

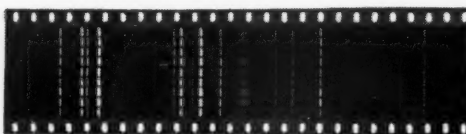
Uniform performance means predictable chemical behavior—dependable performance as a rust-inhibitive paint, day after day, job after job.

Furthermore Red Lead has the property of controlling acid conditions recognized as accelerators of rust. In the presence of various acids, Red Lead forms insoluble lead salts, at the approximate rate at which the acids are supplied. This is true whether the acids originate from acid forming environments, such as gas, smoke, and moisture in the atmosphere, or from the oxidation of the paint vehicle.

Remember, too, that Red Lead is compatible with practically all vehicles commonly used in metal protective paints, including all the fast drying resins.

**Specify RED LEAD
for All Metal Protective Paints**

The value of Red Lead as a rust preventive is most fully realized in a paint where it is the



These spectrograms show the high degree of uniformity and purity of nine different batches of Red Lead. Each spectrum is a practical duplicate of every other. Such uniformity is an important reason for Red Lead's outstanding performance.

only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint. No matter what price you pay, you'll get a better paint for surface protection of metal if it contains Red Lead.

* * *

Write for New Booklet — "Red Lead in Corrosion Resistant Paints" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel. It describes in detail the scientific reasons why Red Lead gives superior protection. It also includes typical specification formulas. If you haven't received your copy, address nearest branch listed below.

* * *

The benefit of our extensive experience with metal protective paints for both underwater and atmospheric use is available through our technical staff.

NATIONAL LEAD COMPANY: New York 6, Buffalo 3, Chicago 80, Cincinnati 3, Cleveland 13, St. Louis 1, San Francisco 10, Boston 6 (National Lead Co. of Mass.); Philadelphia 7 (John T. Lewis & Bros. Co.); Pittsburgh 30 (National Lead Co. of Pa.); Charleston 25, W. Va. (Evans Lead Division).



Dutch Boy Red Lead



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IN THIS PICTURE?**

Answer...

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AND HOSE
BATTERY BOX
AND CABLE**

**He's using the
100%
SELF-CONTAINED**



SYNTRON

GASOLINE HAMMER

PAVING BREAKER
and what a fast job he does!



**BUSTS
CUTS
DIGS
TAMPS**

The explosive energy of gasoline—producing 2,000 heavy, powerful blows per minute of a free-floating piston—makes short work of busting concrete, cutting asphalt, digging in clay and shale, tamping, and a host of other jobs.

Write for full particulars.

SYNTRON CO.

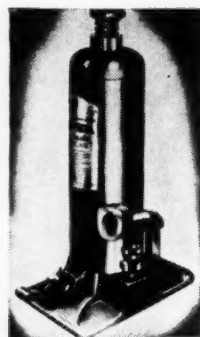
500 LEXINGTON, HOMER CITY, PA.

**THE POWERFUL ONE-MAN
"GANG-OF-ALL-WORK"
THAT'S SYNTRON**

SHOVEL AND CRANE, known as TL-20, can be equipped with choice of five interchangeable booms and ten different types of mountings. Unit assembly principle enables each major component, clutch shaft, cab engine and accessories, and hoist shaft, to be removed as unit and



replaced with similar complete unit. Other turntable features include one-piece, all-welded turntable beds, hook rollers, extensive use of anti-friction bearings, cut gears throughout with all gears except two intermittently used gears running in constant oil bath. All five shoe-type clutches controlling unit are mounted in one unit-assembly and are interchangeable. Power is transmitted from clutch shaft to other functions by noiseless roller chains.—**Thew Shovel Co., Lorain, Ohio.**



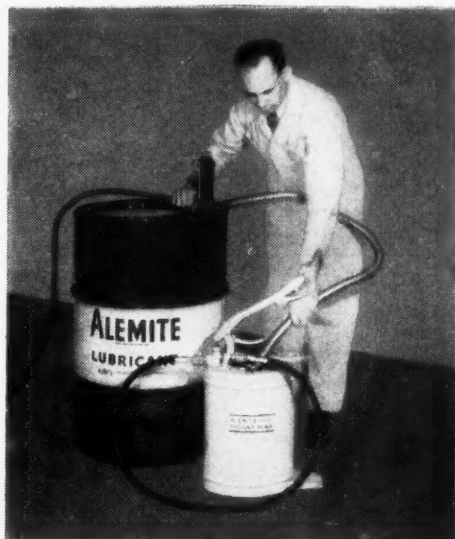
HYDRAULIC JACK — Nu-Hydro Liftmaster jack with base of forged steel is said to be exceptionally durable and to eliminate leakage through porous castings. Pump piston is of tool steel hardened and ground and bronze guide bearing with long bearing surface is used at bottom of precision-ground ram. This jack has been streamlined to have few drilled holes, simple mechanism and no cotter keep. It has minimum starting height, maximum hydraulic lift and screw extension. Six models are available of 3 to 30 tons capacity.—**The Joyce-Gridland Co., Dayton 3, Ohio.**

ELECTRIC FORK TRUCK—Conservation of aisle width is claimed for Lewis-Shepard 4,000-lb. capacity electric power fork truck. Using 48-in. fork and carrying 48-in. load, this truck will enter aisle 12 ft. wide and, in one continuous forward travel of truck, make single right-angle turn and right-angle stack, with no backing or filling.—**Lewis-Shepard Products Inc., 222 Walnut Street, Watertown 72, Mass.**

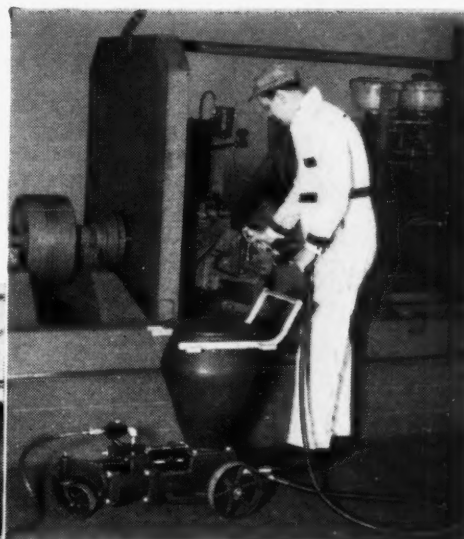
Dependable, Fast, Positive Lubrication

with Rugged Alemite Equipment

Developed for the Construction Industry



For proper handling of lubricants, use the Alemite transfer pump. This easily operated unit provides a clean, rapid method of transferring petroleum products to any piece of lubricating equipment. It handles oil, grease and other fluids from original containers without mess or waste. The original containers remain sealed against dirt, moisture and foreign particles. At no time from barrel-to-bearing is the lubricant exposed to any contamination.



For heavy duty requirements, use this Alemite high pressure pump. Known as the "rock crusher," it has the "oomph" to force grease into tough spots. It's air-operated and provides power lubrication when extensive lubrication needs make manual methods impractical. What's more, this pump handles a volume delivery of heavy fibrous lubricants even at low temperatures.

For volume delivery of lubricants, use the Alemite Volume pump. This unit was designed for track roller and idler bearing lubrication. The pump has a capacity of 35 pounds and develops 3500 lbs. pressure. Engineered to easily handle all grades of light-bodied or semi-solid lubricants that seek their own level. Lubricant is always protected from dirt and moisture.

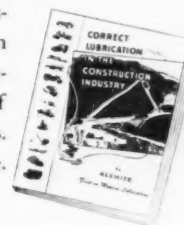


For Complete Details About New Alemite Equipment Send the Coupon

THE THREE PIECES illustrated are only part of the new line of Alemite Equipment developed specially for the construction industry.

The line includes equipment to meet every lubrication need and to handle all types of lubricants in any temperature. It all results in the correct type of lubrication to protect machines in the rugged operating conditions peculiar to the industry.

Complete details are available in a new FREE booklet, "Correct Lubrication in the Construction Industry." The booklet contains valuable information—needs of many types of machines—proper selection of special lubricants—best methods of application—quick facts on various lubricants. It's a handy size to keep for ready reference. Send for your copy—use the coupon.



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Send along the free booklet, "Correct Lubrication in the Construction Industry."

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-  Races against time and penalties—
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Build with Blaw-Knox Steel Forms and you soon establish a reputation for winning races—a reputation that will bring you more jobs and more profitable contracts.

Whether your job is large or small, you should investigate the advantages of Blaw-Knox Steel Forms, and you will want to use the time-saving money-making methods explained in the Blaw-Knox Steel Forms Bulletin No. 2035.

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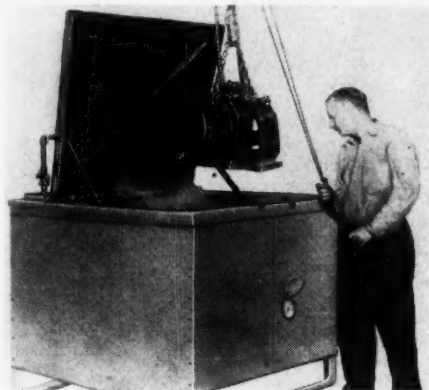
*For the man who
builds TUNNELS, SEWERS,
WALLS and other concrete
structures*

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BLAW-KNOX STEEL FORMS

MOTOR BLOCK CLEANING TANKS

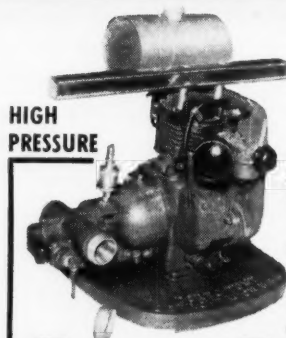
—Two new models are designed for degreasing of diesel motors, truck, tractors and similar large motor blocks. Both are used in connection with hot dip alkali cleaning process. Units are fully insulated and heated from inside by means of patented removable immersion tube system with burner in burner "well" within fully insulated tank. Standard equipment includes built-in dial thermo-



meter, heavy-duty removable grilles, scum gutter, sludge drain, draw-off cock, and double-braced hinged covers. Provision is also made for automatic heat controls for thermostatic temperature regulation from 100 to

(Continued on page 126)

HIGH PRESSURE UTILITY PUMP



**HIGH
PRESSURE**

**Engineered
EFFICIENCY**

- FOR DAIRY BARN
- JETTING BY
- BRIDGE & DOCK
- CONTRACTORS
- PLACER MINING
- TESTING WATER
- MAINS
- STAKE JETTING
- BY FISHERMEN
- OIL WELL SURVEY

PORTO-PUMP

Small towns and resorts, financially unable to own and maintain high priced fire pumper, can now afford fire protection. Porto-Pump can be mounted in rear of light truck, motor scooter or trailer.

Independently powered, self sufficient and engineered for continuous use at consistent high efficiency, the rubber impellers deliver over 40 U. S. gallons per minute at 120 lb. pressure by actual flow-meter test.

Where hydrants are not available, use water from ditches, lake or cistern. Dirty water does not effect rubber impellers causing Porto-Pump to lose pressure—a common fault of many metal impeller pumps.

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PORTO-PUMP, INCORPORATED
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"They say it's the best way to reach hard-to-get-to places!"

And they're right! For with Rex Pumpcrete, *the pump that pumps concrete through a pipe line*, you can reach places difficult to get to with ordinary concrete-placing methods . . . without expensive preparatory work.

Pumpcrete transports on one or more levels . . . elevates or lowers and distributes concrete in one operation, advances construction sched-

ules and usually cuts concreting costs on many types of jobs.

Check your next job to see whether or not it's a Pumpcrete job. And send for your copy of Bulletin No. 466 that contains the facts about *concrete by pipe line*. See your local Rex Distributor or send direct to Chain Belt Company, 1664 W. Bruce St., Milwaukee 4, Wisconsin.

CHAIN BELT COMPANY of MILWAUKEE



CONSTRUCTION MACHINERY



PUMPS



PAVERS



PUMPCRETES



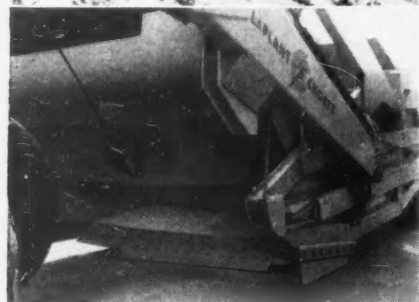
MOTO-MIXERS



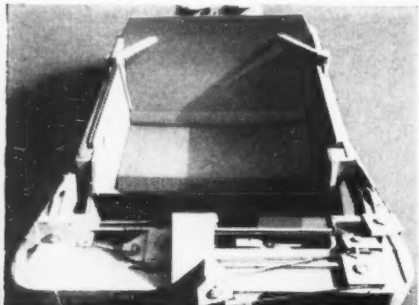
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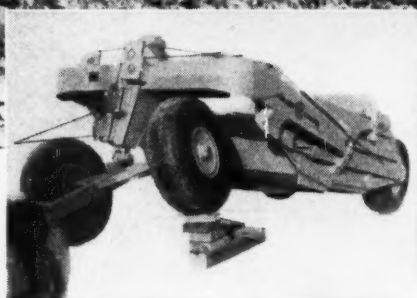
Carrimors* give you



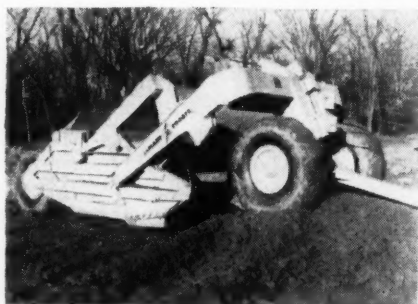
• **THEY'RE "LOADING FOOLS"** — Bowed offset cutting edge insures instant penetration in all kinds of scraper material. Curved bottom and low, wide bowl also make it easy to get heaped loads in a hurry. Note generous apron opening for loading without any forward movement of rear gate.



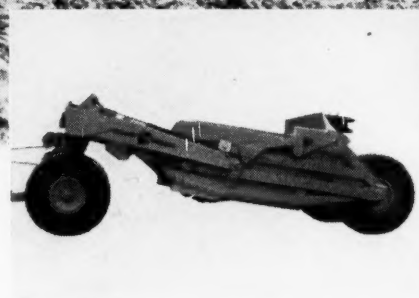
• **OPEN TOP DESIGN**—Pioneered by LPC engineers, this popular feature eliminates overhead clearance worries, increases stability and simplifies loading with shovel or dragline when scraper is used for utility hauling and spreading.



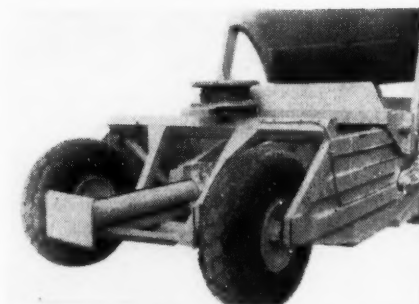
• **OSCILLATING FRONT WHEELS** — Provide ample clearance between front tires and frame, thus permitting "Carrimors" to load, haul and spread in almost any terrain, without damaging front tires.



• **CONTROLLED DIGGING**—A simple adjustment of the hoist cable enables you to get more dig from a level position—a big advantage when you're working low spots cleaning ditches or digging stock ponds.



• **AMPLE CLEARANCE UNDER BOWL** — Enables LPC "Carrimors" to negotiate steep grades and rough ground without high centering. Low center of gravity, proper weight distribution and low over-all height mean greater stability.



• **RIGID GATE ALIGNMENT**—Three-point gate suspension on rollers maintains perfect alignment under all conditions. Center guide post also houses gate return spring and acts as buttress for pusher block.

LaPLANT

Job-Proved

MORE of everything

more

LOADability!

more

HAULability!

more

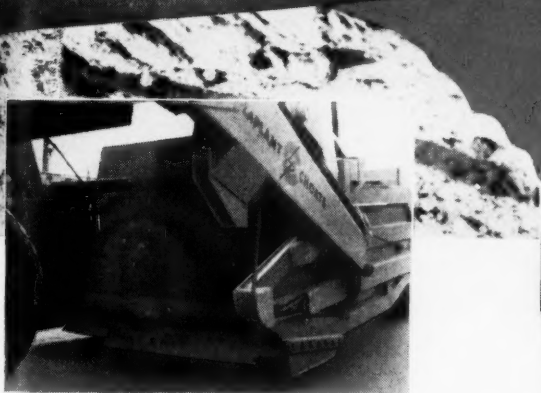
SPREADability!

more

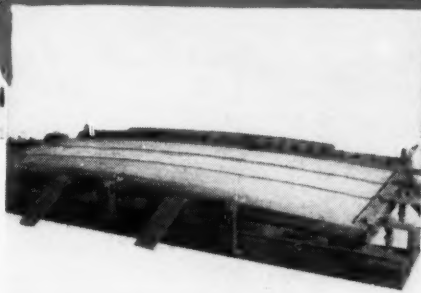
PROFITability!

● When it comes to buying tractor-scraper rigs remember it's the scraper that makes the money. That's why hundreds of the nation's leading contractors are turning to job-proved LaPlant-Choate Carrimors*—the scrapers that give you more production under all conditions and can prove it by competitive tests! Better get complete facts today from your nearest LPC distributor. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; 1022 77th Avenue, Oakland, Calif.

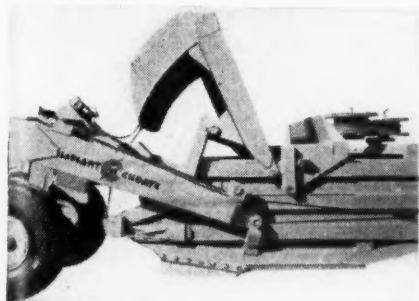
*Reg. U. S. Pat. Off.



● **POSITIVE FORCED EJECTION** — Rear gate actually "bulldozes" all material out of the bowl, leaving the bottom and sides perfectly clean after every trip. Not only quicker and more positive but also permits using scraper as a rough grader.



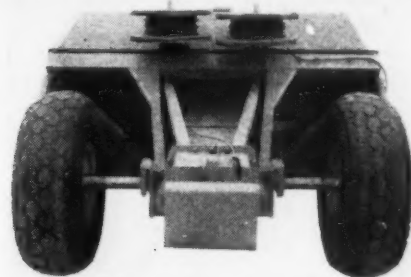
● **REINFORCED BOWL BOTTOM** — A 2" seasoned oak plank filler between the top and bottom plates lends extra strength to bowl bottom and helps prevent permanent deflection or denting by rocks, stumps, etc.



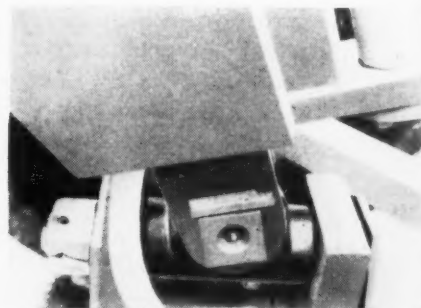
● **HIGH LIFTING FRONT APRON** — Note how LaPlant-Choate's patented linkage arrangement lifts the front apron ahead and out of the way. No chance of jamming sticky or bulky material between the rear gate and apron.



● **EASY TO SERVICE** — All moving parts on the new LPC "Carrimor" are easily accessible and are designed with standard grease gun fittings. In addition, wheel bearings are easily adjusted without removing the wheels.



● **STRONGER AND LIGHTER** — Use of out-board bearing suspensions of rear axles permits stronger design without excess dead-weight and provides ample clearance for oversize tires where needed for extra flotation.

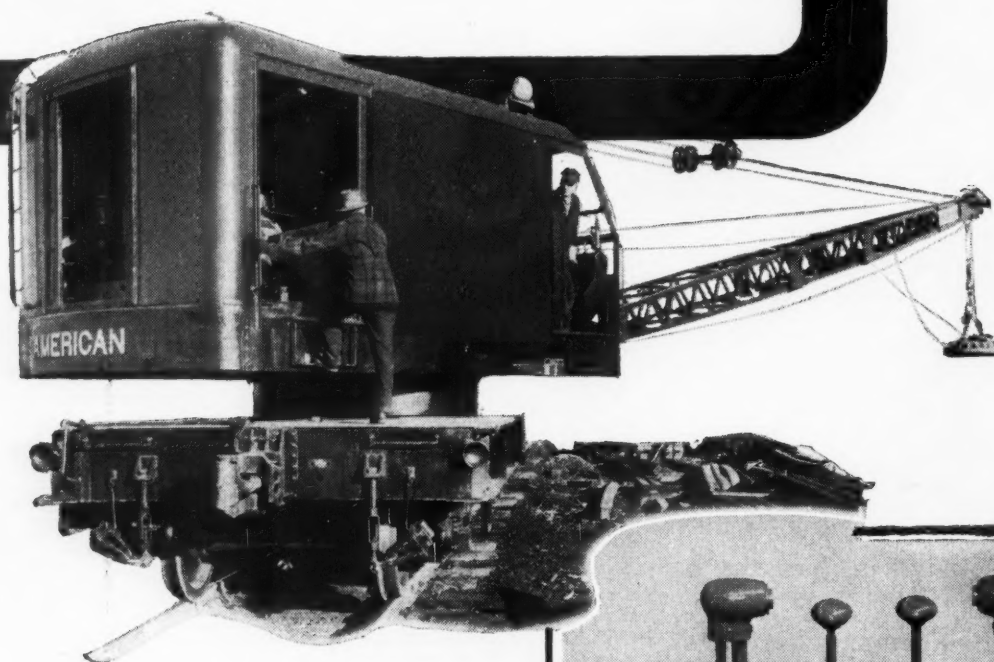


● **ADJUSTABLE KINGPIN ASSEMBLY** — Specially designed pin for taking up wear eliminates sloppy play and keeps vital king-pin assembly tight. Close-coupled universal action — lighter, stronger.

CHOATE

Equipment... for Lowest Possible Cost in Moving Earth

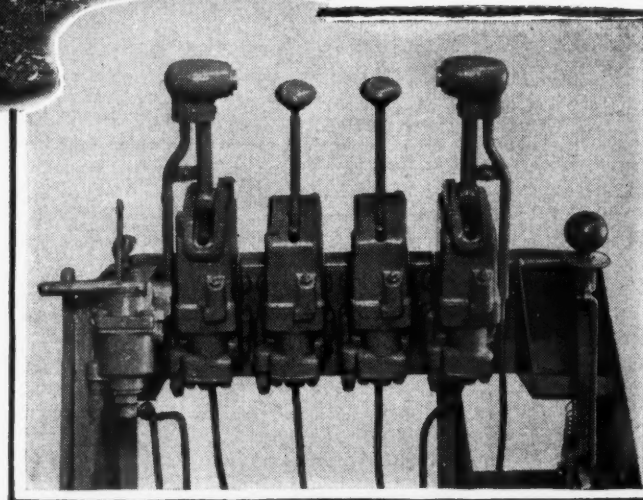
Enginairing
lifts a load off the operator
in this AMERICAN
LOCOMOTIVE CRANE



When it comes to lifts, this new diesel-electric locomotive crane, built by American Hoist and Derrick Company, does double-duty. It not only handles its regular burden, but it lifts a load from the shoulders of the operator, through its *Enginaired* controls.

W·A·B Flexair valves control the clutches on both main drums, on the slewing drive, and on the boom raising mechanism. Clutches are smoothly and easily engaged, eliminating harmful shocks.

W·A·B Control equipment is simple, positive and rugged. Any desired operating force, from ounces to tons, can be designed into the system, but only a finger-touch is required to operate the valves.



To get the most in precise and effortless control in your new cranes, ask for W·A·B Control equipment.

WESTINGHOUSE AIR BRAKE COMPANY

INDUSTRIAL DIVISION • WILMERDING, PA.



PNEUMATIC CONTROLS



AIR COMPRESSORS



WABCO PACKING



What

"ENGINEERED  FOR BALANCE"

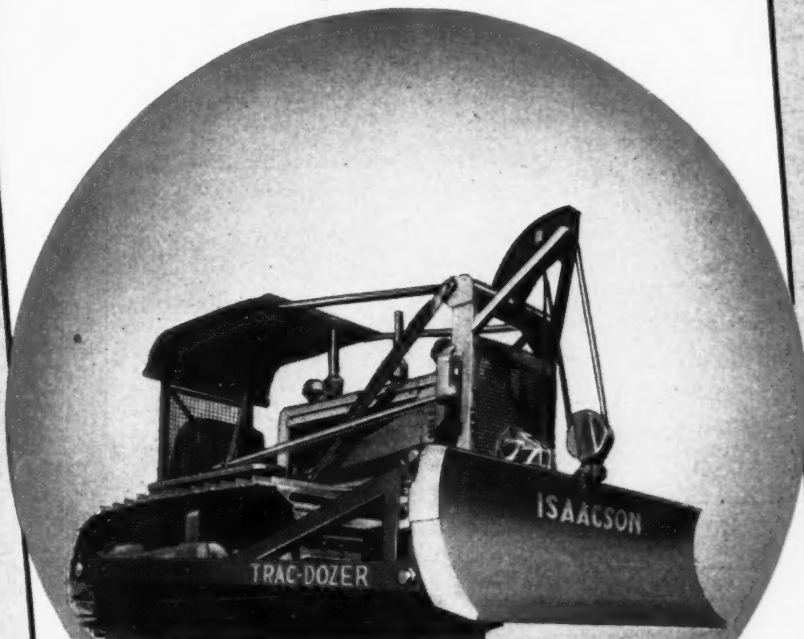
means to you!...

1. **GREATER ECONOMY OF OPERATION**
Isaacson Equipment is "tailored" to your International TracTracTor for better performance, longer life, greater power and less tractor wear.
2. **GREATER PRODUCTION AND PROFITS**
Isaacson Equipment is the modern method of speeding up production. You finish a job sooner, get a start on the next job quicker, and increase profits at every step.

For satisfaction, long wear, economy and dependability—

**BUY ISAACSON FOR YOUR
INTERNATIONAL
TracTracTor**

Detailed information is available on each unit of the complete Isaacson line of Tractor Equipment. Write for it today!



Sold and Serviced by International Dealers All Over the World



KABLE TRAC-DOZER



KLEARING BLADE



KABLE SUPER-ROOTER



SINGLE POWER UNIT



DOUBLE WINCHOIST



HYD. SUPER-ROOTER



HYD. TRAC-DOZER



KARRY-SKRAPER



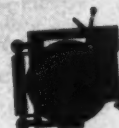
DOUBLE POWER UNIT



TAMPING ROLLER



KARRY-ARCH



OIL WINCH



WINCHOIST

ISAACSON

Tractor Equipment

A PRODUCT OF THE ISAACSON IRON WORKS • SEATTLE



*Make your
dump trucks
load
themselves!*

Install speedy **Butler** **Truck Loaders**

**ONE TON
PER MINUTE**

Eliminate labor and expensive, special loading equipment costs! Let Butler TruckLoaders do the whole job at **BETTER THAN A TON A MINUTE!** • Butler Hydraulically operated TruckLoaders are versatile, too . . . They build their own roads—load all kinds of loose materials—and, in addition, have a digging action similar to a scraper. • Remember also that Butler TruckLoaders can be quickly installed on your present dump truck equipment. Write for full descriptive literature.

SPECIFICATIONS *

SHOVEL WIDTH	4'
STRUCK MEASURE	12 CU. FT.
LIFTING CAPACITY	1400 LBS.
OPERATION CYCLE	25 SECONDS
WEIGHT (APPROX.)	1600 LBS.

*All specifications subject to change without notice

Butler
ENGINEERING
& MANUFACTURING CO.

1052 West Sixth Street • Los Angeles 14, California



Loading street sweepings next to the curb



Sensitive control permits ease of operation



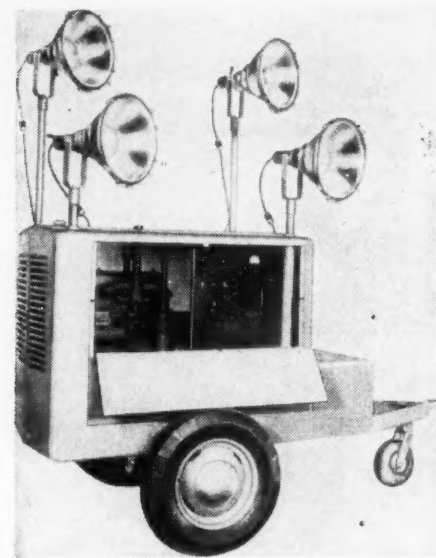
Shovel rides on load while traveling

Dealers Wanted! Many sales franchises are now available throughout the entire U.S.!

(Continued from page 120)

550 deg. F. Model 25T features normal dipping capacity of 270 gal. with dipping space 34 in. long, 38 in. wide and 30 in. deep. Inner shell is of 14-gage steel. Model 34T features 60x38x36-in. dipping space with normal dipping capacity of 355 gal. It is manufactured of 12-gage steel.—**Aeroil Products Co., West New York, N. J.**

FLOODLIGHT—Independent, "on-the-spot" light and auxiliary power are provided by wheel or skid-mounted gasoline-driven floodlight unit. It furnishes 120 v. single phase and 208 v. three phase current to four 1,000-w. adjustable, wide-diffusion lamps. Floodlight has automatic voltage regu-



lation and each light is individually protected by circuit breaker. Pyrex lenses are used on all lamps. Sturdy trailer assembly will withstand severe shocks; it has a retractable third wheel. Permanent alignment is assured by interlocking of generator frame with flywheel housing.—**Consolidated Diesel Electric Corp., Mount Vernon, N. Y.**

ROLLER BEARING—Heavier loads at higher speeds and lower temperatures can be carried by spherical roller thrust bearing. It is expected to facilitate wind tunnel operation for research into gas turbine and jet propulsion speeds and designs and to ease maintenance and operating problems on large vertical water pumps, electric generators and other high-speed machines. Self-aligning principle compensates for any shaft deflections, distortions or weaves and permits heavy loads to be distributed evenly over all rollers. Cage retaining sleeve pressed into bore of inner ring makes contained assembly of rollers, cage and inner ring.—**SKF Industries, Inc., Philadelphia, Pa.**



ALL-WHEEL-DRIVE FORDS... CONVERTED

THE LOW-COST ANSWER TO TOUGH TRUCKING PROBLEMS

Marmon-Herrington converted Ford trucks put the many and truly great advantages of *All-Wheel-Drive* power and traction within the reach of all truck operators . . . at practical low cost.

For more than a decade, Marmon-Herrington *All-Wheel-Drive* converted Fords have been demonstrating their extraordinary ability to transport peak payloads at rock-bottom cost—*regardless of weather or terrain—on the highway or off*. With live power and traction in every wheel—*front wheels pulling, rear wheels pushing*—these great sure-footed trucks are complete masters of every operating condition—deepest mud, sand or snow, steepest hills and grades.

Marmon-Herrington converts all standard Ford models to *All-Wheel-Drive*—passenger cars, station wagons and pick-ups converted to four-wheel-drive; larger truck models converted to four- and six-wheel-drive. These vehicles represent the best engineering skill of the world's greatest automotive producer, plus the highly specialized abilities of the Marmon-Herrington organization—long famous in the development of high-traction, multiple-wheel-drive vehicles for the most severe on- and off-the-road service.

Complete information on Marmon-Herrington Ford conversions and Heavy-Duty *All-Wheel-Drive* trucks is available at world-wide Marmon-Herrington dealer establishments, or from the factory direct.

MARMON-HERRINGTON COMPANY, INC. • INDIANAPOLIS 7, INDIANA

MARMON-HERRINGTON

ALL-WHEEL-DRIVE

THIS SERVICE IS COMPLETE, FLEXIBLE...

Fits Your Specifications!



SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: Magnolia Petroleum Company, General Petroleum Corporation

Aren't these the Time Problems you're faced with? Here are Practical Down-to-Earth Solutions!

QUESTION: Paying the penalty for machine failures—in *slower* progress, *lower* output?

ANSWER: We can help you keep all your equipment operating full time, at peak efficiency—by meeting *all* your oil and grease requirements with exactly the *right* quality lubricants.

QUESTION: Are you killing too much time refueling and lubricating your equipment out in the field?

ANSWER: No matter how far afield you are, we can schedule regular deliveries on the job. Result: Less time out for oiling, greasing, refueling. Fewer inventory problems, too.

QUESTION: What about maintenance? Does it tend to gum up work-progress?

ANSWER: Our representative provides job-tested maintenance plans based on a study of *your* operating methods, *your* equipment . . . helps adapt these schedules to your special needs.

QUESTION: Are certain "problem" machines continually lying down on the job—slowing operations?

ANSWER: Your Socony-Vacuum Representative can analyze equipment problems, make proper recommendations. In critical cases, he can also bring in qualified engineering aid.

Why Be Satisfied Merely With "Gas and Oil" When You Can Get Complete Service!

SOCONY-VACUUM
Contractors' Lubrication
SERVICE

CORRECT LUBRICATION
FOR EVERY PART
OF EVERY MACHINE
-Real Help with Maintenance Problems!

Tune in Benny Goodman and His Orchestra, Monday Evenings, 9:30 E.D.T.—NBC

on the spot

BENDING

COLD

QUICK

ACCURATE

with the W-S Portable Pipe Bender

THE Watson-Stillman Portable Hydraulic Pipe Bender will bend pipe or tubing up to 3 inches cold and right on the spot where it is needed.

Its open jaw construction permits the pipe to be inserted without removing bending dies or former. The work is in full view during the bending operation and the degree of bend can be checked at any point without removing pipe from the bender.

The bender is ruggedly constructed of forged steel and the pump cylinder is made from seamless steel tube. It will bend all standard, extra strong and double extra strong steel pipe from $\frac{3}{8}$ " to 2" as well as standard weight pipe in $2\frac{1}{2}$ " and 3" sizes. Bending dies are supplied for each size of pipe.

WATSON-STILLMAN COMPANY
Distributor Products Division
ROSELLE, NEW JERSEY
Sold only through distributors



WATSON-STILLMAN
DISTRIBUTOR PRODUCTS DIVISION

1025



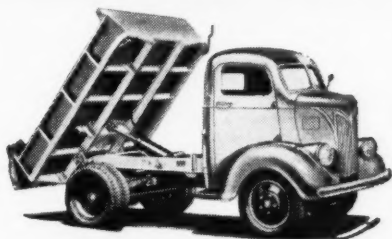
Designers and Manufacturers of Forged Steel Fittings, Valves, Wire Rope Shears,
Hand Pumps, Jacks, Pipe Benders and Hydraulic Equipment

SINCE 1848

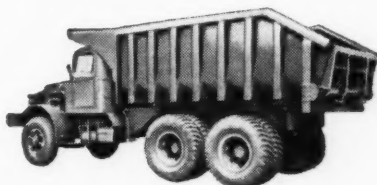
The BEST COSTS LESS

TRADE MARK

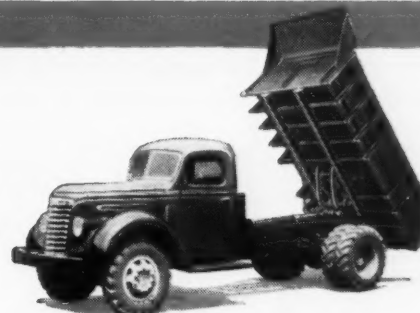
For years Gar Wood has consistently offered truck and trailer equipment of utmost utility and outstanding value. Leadership in this field resulted from this policy. Gar Wood equipment costs less in the long run because it is better built to give peak performance and lasting satisfaction.



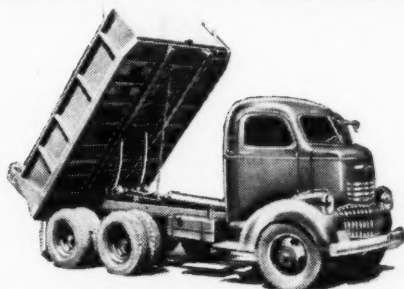
Type C12 Body and Model D6 or D7 Hoist. Dumping angle 55°.



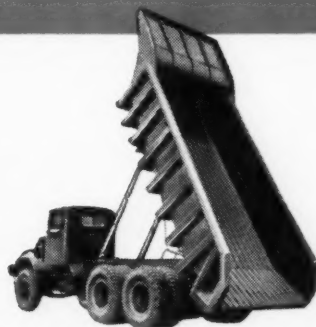
Type X-112 Extra heavy duty Body with automatic downfolding tailgate.



Special rock Body, scoop type rear end. Model F4CA cam and roller Hoist.



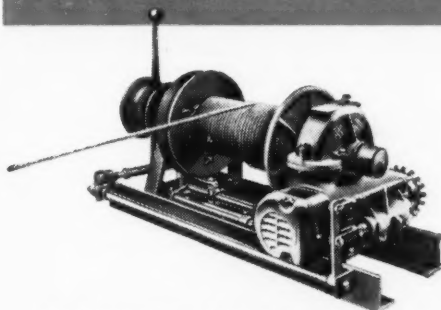
Type W12 Body. Model F4C cam and roller Hoist. Capacity 6 cu. yds.



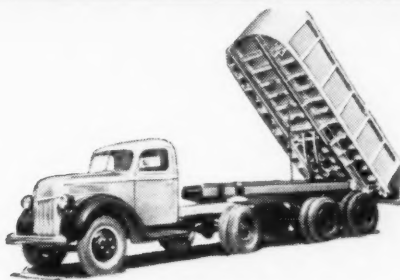
Type X-112 Extra heavy duty Body, scoop end, with Model T-4440 Hoist. Capacity 19 cu. yds.



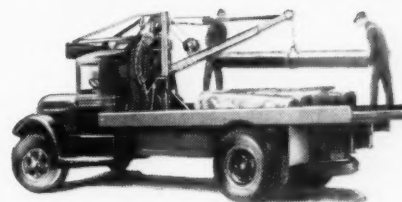
Type W12 Body, front recessed for Model TV83 Hoist. Capacity 15 cu. yds.



Rapid Reverse truck Winch. Single lever control. Capacities 15,000 to 60,000 pounds line pull.



West Coast Special W-12 Body, Model F8C cam and roller Hoist. Capacity 10 cu. yds.



Telescopic boom Crane. Radius 8 to 20 feet.



GAR WOOD INDUSTRIES, INC.

7924 RIOPELLE ST.

DETROIT 11, MICH.

WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

OTHER PRODUCTS: TRUCK TANKS • ROAD MACHINERY • HEATING EQUIPMENT • MOTOR BOATS



FAST WAY TO CLEAN EARTH-MOVING EQUIPMENT

Now you can place the cleaning of your earth-moving units on a **PAYING BASIS**, with the **NEW** special-purpose alkaline material.

Oakite Composition No. 92

Use this heavy-duty cleaner for quickly breaking-up heavy oil, grease and asphaltic soil deposits that accelerate depreciation of excavators, scrapers, drillers and other equipment. Combine Oakite Composition No. 92 with the controlled heat and power of Oakite steam cleaning. Apply it with "socko" impact to exposed and recessed surfaces, by means of the Oakite Solution-Lifting Gun. Then, as it drives down to the bare metal, watch it break all dirt-slugging records!

Oakite Cleaning Helps Keep Bids Low!

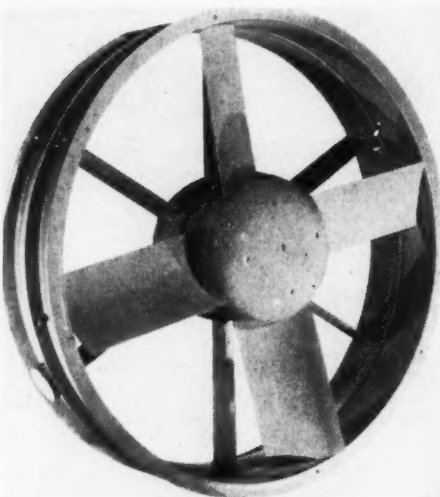
Extremely economical to use, a little Oakite Composition No. 92 goes a long way toward reducing out-of-service time . . . lightening equipment power load . . . improving operating efficiency . . . forestalling too-early replacements. Ask your local Oakite Technical Service Representative, a trained troubleshooter, for application details. His **FREE** service is yours for the asking! No obligation.

OAKITE PRODUCTS, INC.

248 Thames Street, New York 6, N. Y.
Technical Service Representatives Located in All
Principal Cities of the United States and Canada

OAKITE *Specialized*
CLEANING

VENTILATING-TYPE FAN—Corrosion-resistant fan of monel metal for damp or corrosive vapors or of cold rolled steel for ordinary exhaust ventilation and cooling is made in 3- to 5-ft. diameters. Special high slip, slow speed, direct drive motor, equipped with permanently greased and sealed ball bearings makes it possible to mount unit in any position. Motor is 18 pole, 375 rpm., 220 v. single phase or 220 to 440 v. three



phase, with input of 700 w. Motor is internally cooled by circulating air within hub of fan without drawing in outside air that might be contaminated. Guide vanes on inlet side of
(Continued on page 134)

GRIFFIN

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WELLPOINT SYSTEMS — JETTING PUMPS

FOR SALE
RENT

Prompt Shipments

Send for our New 60 page
illustrated catalog

"GRIFFIN POINTED WELLPOINT
FACTS" check full of latest infor-
mation on Wellpoint Systems for
dewatering, emergency and per-
manent water supply systems,
also information on pressure
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881 EAST 141st ST. • NEW YORK 54, N. Y.
Phones: ME1rose 5-7704-5-6

Worthington-Ransome Blue Brute Distributors

See ad on Page 133 for list of
equipment in each line

Worthington-Ransome Distributors

Ala., Birmingham, Construction Equip. Co.
Alaska, Anchorage, Airport Mac. & Storage Co.
Ariz., Phoenix, Lee Redman Co.
Cal., San Francisco, Coast Equip. Co.
Cal., Los Angeles, Golden State Equip. Co.
Colo., Denver, Power Equipment Company
Conn., New Haven, Wilhelm-Davies Co., Inc.
Fla., Miami, Allied Equip., Inc.
Fla., Orlando, Highway Equip. & Supply Company
Tampa, Epperson & Company
Ga., Atlanta, Tractor & Machinery Company
Ida, Boise, Olson Manufacturing Company
Ill., Chicago, Chicago Construction Equipment Co.
Ky., Harlan, Croushorn Equip. & Supply Co.
Maine, Portland, Maine Truck-Tractor Company
Mass., Allston, Boston, Clark-Wilcox Co.
Mich., Muskegon, Lakeshore Machy. & Supply Co.
Minn., Minneapolis, Philippi-Murphy Equip. Co.
Miss., Jackson, Jackson Road Equip. Co.
Mo., Clayton, The Howard Corporation
Montana, Billings, Interstate Truck & Equip. Co.
Helena, Caird Eng. Works
N. J., No. Bergen, American Air Comp. Corp.
N. M., Albuquerque, Bud Fisher Co.
N. M., Roswell, Smith Machy Co.
N. Y., Albany, Milton-Hale Machinery Company
New York, Hodge & Hammond, Inc.
N. Y., Olean, Freeborn Equip. Co.
N. Y., Syracuse, Milton-Hale Mach. Co.
N. D., Fargo, Smith Commercial Body Works, Inc.
O., Cincinnati, Carroll-Edwards Co.
Okla., Oklahoma City, Townsco Equip. Company
Ore., Portland, Andrews Equip. Service
S. C., Columbia, Smith Equipment Company
Tenn., Knoxville, Dempster Bros., Inc.
Tenn., Memphis, Independent Tractor Co.
Tenn., Nashville, Dempster Bros., Inc.
Tex., Amarillo, T. W. Carpenter Equip. Co.
Texas, Dallas, Shaw Equip. Co.
Tex., Houston, Contractors Equip. Sales & Service Corp.
Tex., San Antonio, Patten Machy. Co.
Utah, Salt Lake City, J. K. Wheeler Mach. Co.
Vt., Barre, A. M. Flanders, Inc.
Wash., Spokane, Andrews Equip. Service
Wisc., Milwaukee, Drott Tractor Co. Inc.

Ransome Distributors

D. C., Washington, M. A. Doetsch Mach. Company
Ill., Chicago, Thomas Hoist Company
Ind., Fort Wayne, American Steel Supply Corp.
Ky., Paducah, Henry A. Pettey Supply Company
La., New Orleans, Ole K. Olson Company
Md., Baltimore, Stuart M. Christliff & Company
Mich., Detroit, T. G. Abrams
Mo., Kansas City, Brown-Strauss Corp.
Neb., Lincoln, Highway Equip. & Supply Co.
N. J., Newark, Johnson & Dealman
O., Cleveland, H. B. Fuller Equip. Company
Pa., Philadelphia, Giles & Ransome
Pittsburgh, Arrow Supply Company

Worthington Distributors

Ark., Fort Smith, R. A. Young & Son
Little Rock, R. A. Young & Son
Ind., Indianapolis, Reid-Holcomb Company
Ky., Louisville, Williams Tractor Company
La., New Orleans, Wm. F. Surgi Equip. Company
Md., Baltimore, D. C. Elphinstone, Inc.
Mass., Cambridge, Field Mach. Company
Mich., Detroit, W. H. Anderson Co., Inc.
Flint, Grandsen-Hall & Company
Mo., Kansas City, Mach. & Supplies Co.
N. Y., Buffalo, Dow & Co., Inc.
New York, Air Compressor Rental & Sales
O., Cleveland, Gibson-Stewart Company
Toledo, The Kilcorse Mach. Co.
Pa., Allentown, H. N. Crowder, Jr., Inc.
Easton, Sears & Bowers
Harrisburg, American Equip. Corp.
Oil City, Freeborn Equipment Company
Pittsburgh, Atlas Equip. Corp.
Pa., Phil. Metalweld, Inc.
Wilkes-Barre, Ensminger & Company
Texas, El Paso, Equip. Supply Company
Va., Richmond, Highway Mach. & Supply Co.
Wash., Seattle, Star Machinery Company
Wyoming, Cheyenne, Wilson Equip. & Supply Co.

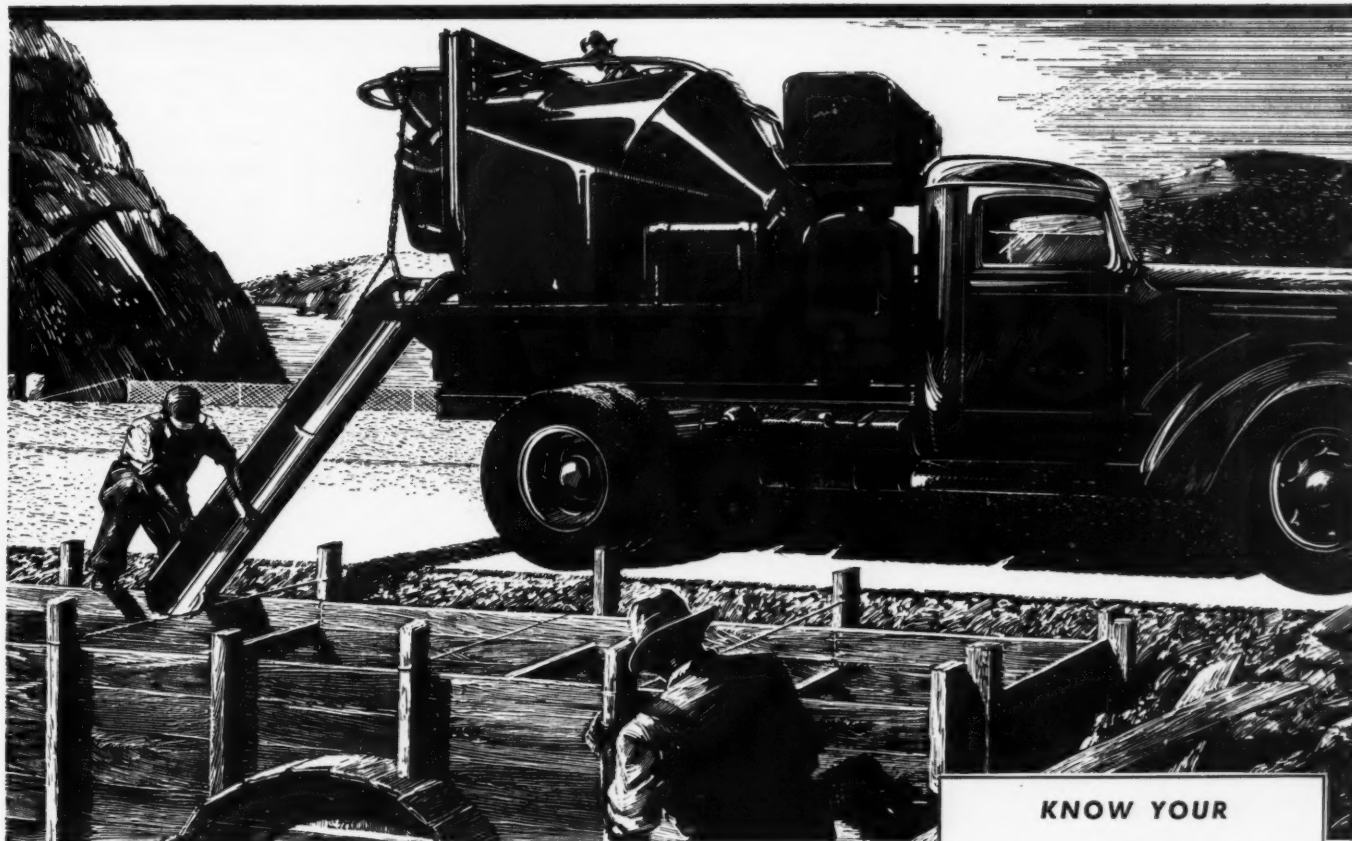
BUY BLUE BRUTES

Worthington Pump and Machinery Corp.

Worthington-Ransome Construction
Equipment Division

Holyoke, Massachusetts

HI-UP... IN NAME, REPUTATION AND QUALITY



Flexibility, engineered into all Ransome Blue Brute Truck Mixers, reaches its peak in the new Hi-Up. This flexibility eliminates all strains resulting from misalignment while charging, discharging, or operating over uneven ground. The truck mixer is designed so that when discharging is completed, all moving parts return to their normal positions.

The transmission shows a marked advance over usual design. Enclosed water pump clutch requires no adjustment and at no time is there any need for manual lubrication. A separate engine clutch, two speeds forward and reverse, and multiple disc clutches assure easier starting, a wider performance range and smoother operation.

Other new design details: Unbreakable, anti-freeze gauge glasses, in full view of the operator . . . Quick-charging, unobstructed hopper, with improved sealing door, prevents jamming . . . Positively leak-proof poppet valves with renewable discs — found only in Ransome Truck Mixers . . . Exclusive mixing drum design, with new type spiral blades, for quick charging and fast, clean discharging.

These are but a few of the reasons why the Blue Brute Hi-Up is setting a new high in truck mixer performance — and offering time-saving, trouble-free production of better concrete at lower cost.

Get the whole story from your nearby Worthington-Ransome dealer, or write for Bulletin No. 221.

MS-7

KNOW YOUR

BLUE BRUTES

Your Blue Brute Distributor will gladly show you how Worthington-Ransome Blue Brute Hi-Up Truck Mixers and other construction equipment can put your planning on a profitable basis — and prove that *there's more worth in Worthington*. His name is listed on Page 132, Blue Brutes include:

RANSOME EQUIPMENT

Pavers, Concrete Spreaders and Finishers*, Portable and Stationary Mixers, Pneumatic Placing Equipment, Truck Mixers, Plaster & Bituminous Mixers and Accessories.

WORTHINGTON EQUIPMENT

Gasoline and Diesel Driven Portable Compressors, Rock Drills, Air Tools, Contractors' Pumps* and Accessories.

*To be announced.

BUY BLUE BRUTES



Truck Mixers
Capacities:
2, 3, 4½ cu. yds.



Portable Mixers
Capacities:
3½, 6, 11, 16, 28 cu. ft.



Big Stationary Mixers
Capacities:
28, 56, 84, 126 cu. ft.

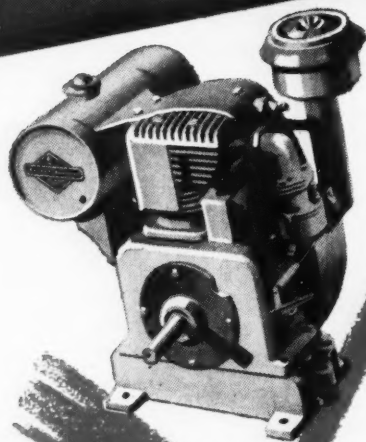


Pneumatic Placer
Capacity:
7, 14, 28 cu. ft.

WORTHINGTON



Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division, Holyoke, Mass.



CHECK

- ✓ for Dependability
- ✓ for Rugged Construction
- ✓ for Long Life
- ✓ for Precision Manufacture and Minimum of Servicing
- ✓ for Instant Starting
- ✓ for Economy
- ✓ for Greater Value

Only BRIGGS & STRATTON

Air-Cooled Engines
Check "OK" On All Counts

Through more than 26 years, Briggs & Stratton 4-cycle air-cooled engines have been subjected to every performance test — and under severest conditions of long, hard use. By coming through with flying colors, they earned world-wide recognition as the "right" power for hundreds of applications on appliances, farm machinery and industrial equipment. Only by specifying Briggs & Stratton engines can users, dealers and manufacturers profit by the technical knowledge, manufacturing facilities and long experience of an organization which has built over 2,500,000 air-cooled engines.

BRIGGS & STRATTON CORPORATION
MILWAUKEE 1, WISCONSIN, U. S. A.

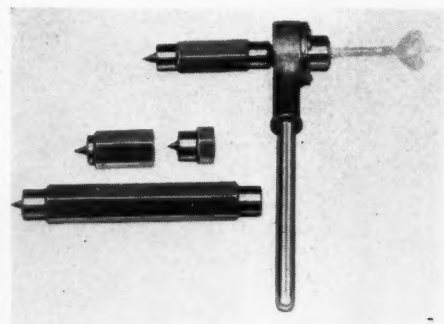


Air-Cooled Power

(Continued from page 132)

fan, which is of axial-flow ventilating type, reduce tendency of air to corkscrew with rotation of blades. Blade tips revolve within ring which reduces tip losses. Large hub eliminates that portion of blade that has low peripheral speed and thereby avoids possibility of backflow of air through center of fan.—**The Moore Co., 544 Westport Road, Kansas City 2, Mo.**

RATCHET DRILL DRIVER is designed for drilling between studs and joists or restricted spaces in buildings or other structures. Compact head allows centering of holes within 1¼ in. of nearest obstruction. Any standard wood bit can be used. Steel drills can be used with adapter



chuck. Thrust of lead screw is carried directly to drill shank by solid shaft. Large wearing surfaces hardened to depth of .010 in. insure long service. Liberty ratchet is fully inclosed in strong semi-steel head. Long lead screw in combination with 1-, 2- and 8-in. extensions allows its use over wide range of dimensions.—**Techtmann Industries, 714 W. Wisconsin Ave., Milwaukee 1, Wis.**

MINE CONVEYOR BELT—Wear-resistance of neoprene has been tested on conveyor belt used for 18 months for raising slate, rock, shale, coal, dirt and water from breaker of bituminous coal mine. After handling about 225,000 tons of material, carcass is said



to show very little wear and to be ready to give service indefinitely. Chemical resistance of material to sulphur in coal is added advantage. This company does not make conveyor belts but supplies neoprene to belting manufacturers.—**E. I. du Pont de Nemours & Co., Wilmington 98, Del.**



SAFE

FAST

ADAPTABLE

Snap-on BOXOCKET WRENCHES

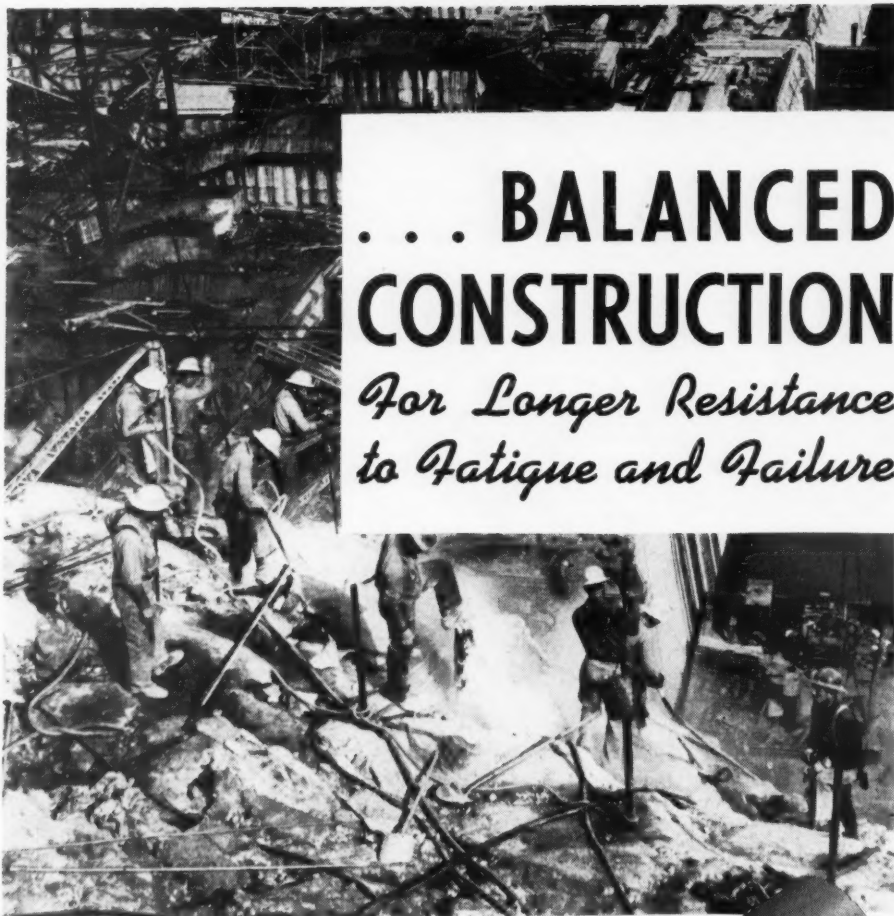
Powerful, safe leverage that invites confident wrench speed

Slipping handily into hard-to-get-at places . . . engaging the nut on all *six* corners with an encircling can't-slip-can't-spread grip . . . needing only *half the space* of an end wrench for full handle movement . . . Snap-on Boxockets are *speed* tools and *safety* tools on tough nut-turning operations. Chamfered openings slip readily over the nut. Double broaching permits operation within a 15° arc. Round handles provide comfortable grip. Snap-on Boxockets work swiftly and efficiently in many spots inaccessible to other wrenches.

For maximum usefulness on a wide range of work, Snap-on offers 13 types of its popular Blue Point Boxockets — in angled, offset, combination and flare nut heads — and in standard wrench sizes from $\frac{3}{8}$ " to $4\frac{3}{8}$ ". Available through Snap-on's nationwide direct-to-user tool service. Write for the Snap-on catalog of industrial wrenches.

SNAP-ON TOOLS CORPORATION
8084-H 28th AVENUE • KENOSHA, WISCONSIN





... BALANCED CONSTRUCTION

*For Longer Resistance
to Fatigue and Failure*

"SUBWAY"

ALL-SYNPLASTIC

AIR HOSE



Sizes $\frac{1}{2}$ " to $1\frac{1}{4}$ "
Max. Lengths of 50'

"SUBWAY" is especially built for the heavy-duty jobs, where highest pressures and severest wear prevail. Balanced construction assures equal service life from tube, carcass and cover—no failure of one part to cause hose to be scrapped while remainder is still good. NOW READY FOR DELIVERY with its pre-war Red Cover, and further identified by the famous Cloverleaf trade mark.

All Goodall products . . . hose, belting, packing, boots, clothing . . . are made to time-tested standards for quality and reliability . . . "Engineered to Your Job." Contact our nearest branch or main office for details.



GOODALL

RUBBER COMPANY • INCORPORATED

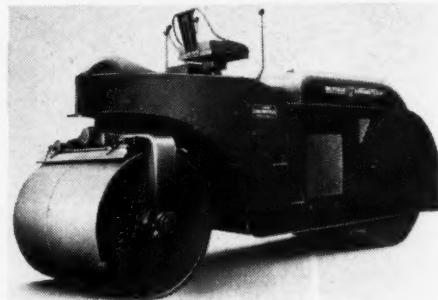
THE GOODALL-WHITEHEAD COMPANIES

Philadelphia • Trenton • New York • Chicago • Pittsburgh • Boston
Los Angeles • San Francisco • Seattle • Salt Lake City • Houston

Factory—Trenton, N. J. Established 1870

WE ARE
PARTICIPANTS IN THE
OWNERSHIP AND OPERATION
OF
NATIONAL SYNTHETIC RUBBER
CORPORATION

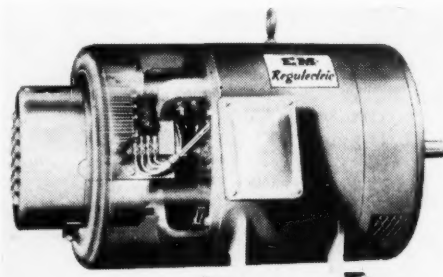
TANDEM ROLLERS are produced in sizes of 5-8 tons, 6-9 tons, 8-12 tons and 10-14 tons and can be powered with gasoline or diesel engines. Features include bevel gear final drive, side air intake drive-opposite-operator, simplified clutch shifter, low



pressure hydraulic steering and compact engine, transmission and final drive pinion unit assembly. Four-speed forward and reverse transmission provides stepped-up speed range. Removable drive roll grill provides readily accessible opening for cleaning and ventilating drive roll. — **Buffalo-Springfield Roller Co., Springfield, Ohio**

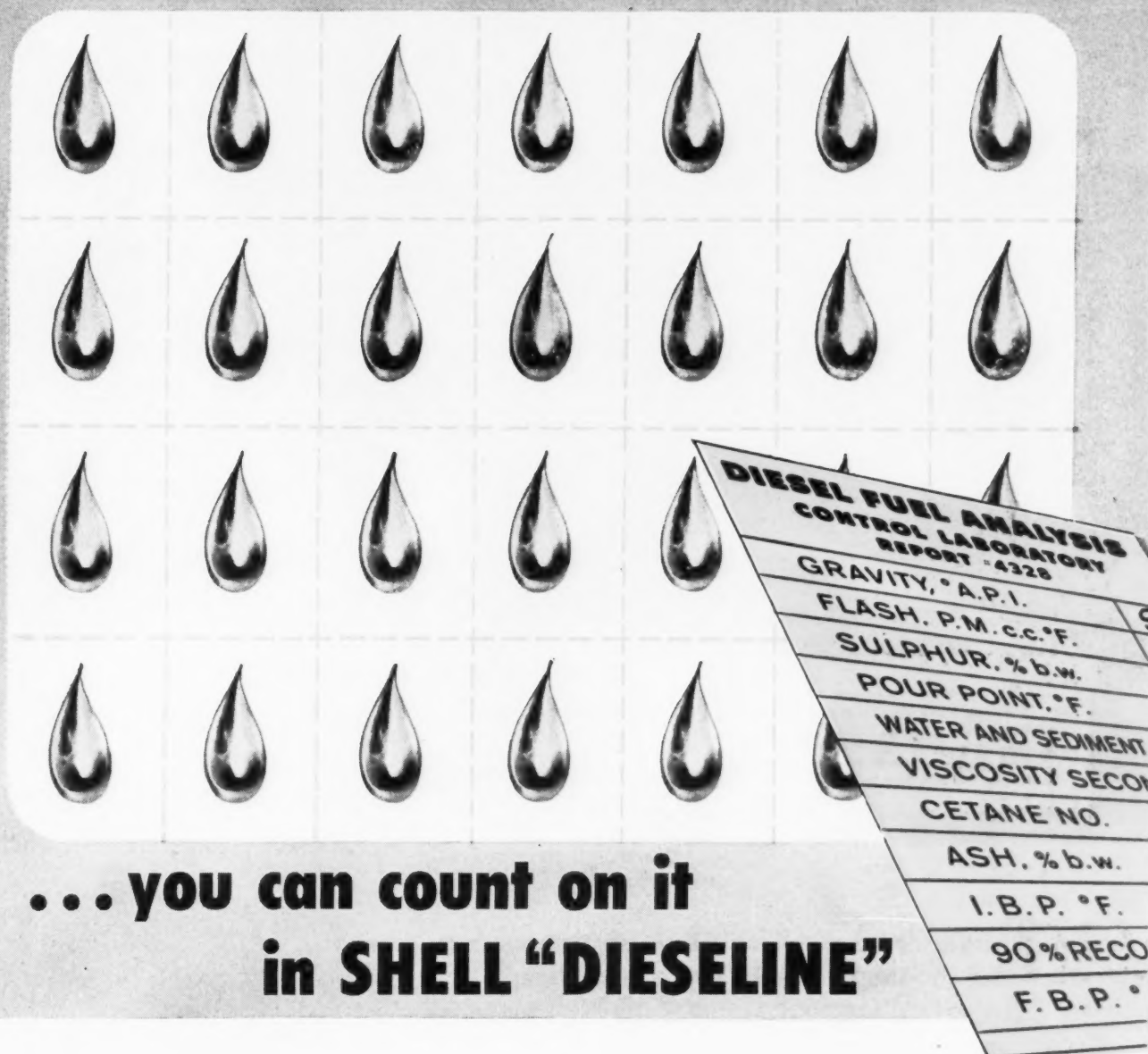
ROOFING MOP—Fiberglass mop unit is designed to cut costs and save time in applying bitumen to roof deck or built-up roofing felts. It consists of warp-like bundles of glass yarns, 36 in. in length and weighing about 2 lb. Two or three bundles are attached to handle to make mop. One mop tested has been used to apply bitumen to more than 100,000 sq. ft. of roofing in three-ply construction without showing serious deterioration. — **Owens-Corning Fiberglass Corp., Toledo, Ohio.**

A. C. GENERATOR provides general-purpose electric power at constant voltage, using built-in voltage regulating circuit employing principles of series resonance. It will maintain



voltage within 2 percent of its rated value from no load to full load with normal engine speed regulation and is instantly responsive to sudden load changes. Regulating circuit has no moving parts. Available in ratings from 5 to 15 kw.—**Electric Machinery Mfg. Co., Minneapolis 13, Minn.**

UNIFORMITY...a most important quality



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CONTROL LABORATORY
REPORT - 4328**

GRAVITY, ° A.P.I.	
FLASH, P.M.c.c.°F.	
SULPHUR, % b.w.	
POUR POINT, °F.	
WATER AND SEDIMENT	
VISCOSITY SECON	
CETANE NO.	
ASH, % b.w.	
I.B.P. °F.	
90% RECO	
F.B.P. °	

**... you can count on it
in SHELL "DIESELINE"**

YOU CAN ANALYZE shipments of Shell "DIESELINE" for uniformity—it's there! It is the month-after-month, year-after-year kind of uniformity that so many Diesel engine operators claim is the best single reason they know for specifying Shell "DIESELINE" for any medium- or high-speed engine.

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of one of the leading engine-makers, for *twelve consecutive years!*

Why not try this modern quality fuel in your engines for a month or two? Keep records and compare with the results you've been getting. Very likely you will be surprised at the top-notch, *consistent* performance you get from Shell "DIESELINE."

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SHELL DIESEL FUELS



WAR BORN TOUGHNESS

in Peace Time **TRUCK TIRES**



**Here's what happens to your tires
when your truck hits a bad bump**

Look at the bruising a tire takes every time it over-rides a bump. It's got to "give" to take it. "Rhino-Flex" Armstrong Tires are built to take far more than ordinary tires. They "roll with the punch" and snap back for more!

Toughness and flexibility of tire casing determine the length of life of your truck tires.

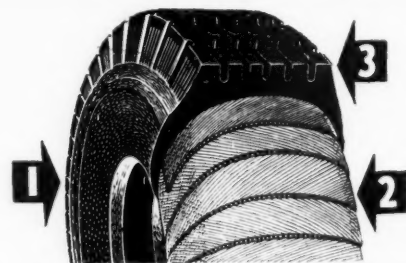
Born of wartime necessity—plus years of tire-making know how—Armstrong's "Rhino-Flex" Weave gives you the *toughest* Armstrong truck tire ever made . . . plus vital, snap-back flexibility.

"Rhino-Flex" Armstrong truck tires now are available coast to coast. See this great new truck tire for yourself. Compare it with any other made today. Once you own Armstrongs, we know you will be convinced that "Rhino-Flex" Armstrongs are the safest, toughest truck tires ever made! See the Armstrong dealer nearest you!

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ARMSTRONG'S AMAZING NEW
Rhino-Flex Weave

**GIVES YOU GREATER SAFETY—MORE
MILEAGE—COMPLETE DEPENDABILITY!**



NEW TOUGHER CARCASS—
a tighter, shorter fabric weave . . . impregnated with a premium blend of natural and synthetic rubbers to give the carcass far greater durability . . . wears longer . . . resists more shock!

NEW FLEXING FABRIC— with tighter, shorter rayon cord, and our special dipping and curing process. The flexibility is greater than we have ever before seen in a tire fabric . . . "gives" with the bump . . . snaps back safely!

NEW FLATTER TREAD— "Rhino-Flex" Weave enables us to build a flatter tread, which means far more rubber on the road . . . safer, surer stops—quicker starts!

ARMSTRONG TIRES



COMING DOWN THE STRETCH! ***... It's STAMINA that Counts***

Inborn ability and patient training are important factors, but the horse most likely to cross the finish line first is the one that has the advantage of extra stamina.

This is true, too, with wire rope. It is extra stamina that counts...and that is where "HERCULES" (Red-Strand) comes in. This has been proved time and time again by its consistent performance record.



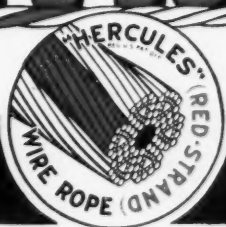
Since this rope was introduced it has continued to increase its many uses in one industry after another, until today, no matter how tough the job, you will find "HERCULES" (Red-Strand) Wire Rope proving it has what it takes to give safe and economical service.

There's a correct construction and type to fit any heavy duty job—anywhere. Consult our Engineering Department on your specific requirements.

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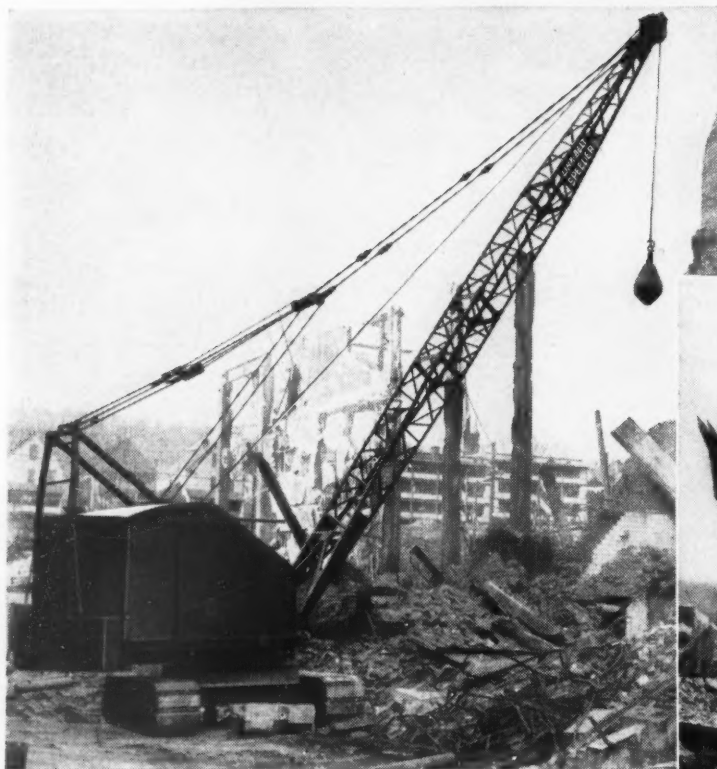
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DEMOLITION OR CONSTRUCTION

-- it's all the Same to a

LINK-BELT SPEEDER



CONTRACTOR FINDS CONVERTIBLE LS-85 BEST MEANS OF WRECKING REINFORCED CONCRETE BUILDING

Razing the large, reinforced concrete power house for the Cherry-Burrell Corporation at Little Falls, N. Y., and doing it fast, called for more than ordinary wrecking equipment. The contractor, Pelnik Wrecking Company, Yorkville, says, "There was only one thing to do—and we did it." They purchased a Link-Belt Speeder LS-85 shovel-crane, which was first fitted with a 70 foot boom and a 2500 pound steel ball. With this rig the huge concrete roof and walls were soon battered down. Reinforcing steel was cut with torches and then the crane, fitted as a shovel, made

short work of cleaning away the rubble, completing the job in record time.

This job demonstrates the superiority of the Link-Belt Speeder method over back-breaking manual methods, and is a striking example of the versatility of the many-purpose, convertible Link-Belt Speeder.

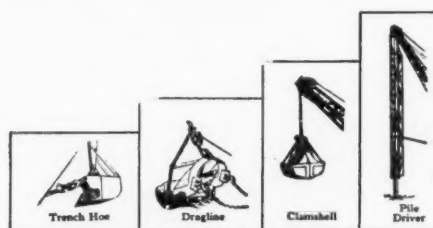
For Prompt, Efficient, Convenient Sales and Service:
There is a Link-Belt Speeder Distributor Located Near You

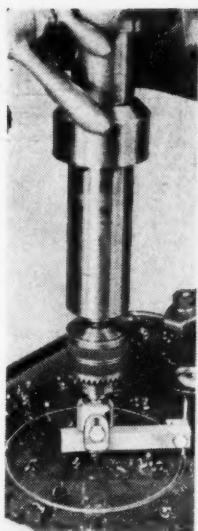
THE SAME BASIC MACHINE

can be used equally well as shovel, crane, dragline, trench-hoe, pile driver. You can keep in the bidding with your Link-Belt Speeder!

LINK-BELT SPEEDER

Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES
LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO-9, ILL.
A DIVISION OF LINK-BELT COMPANY





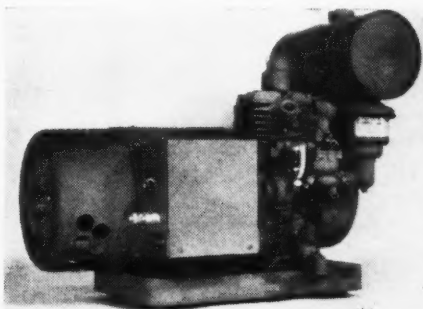
HOLE - CUTTING TOOL cuts holes to any diameter from $1\frac{1}{8}$ to 8 in. through $\frac{1}{4}$ -in. thickness in steel or other tough metals and any thickness up to $1\frac{1}{2}$ in. in plastics, fiber or wood. Operates in any standard drill press, wood-working machine or suitably mounted spindle machine. Consists of combination drill and pilot with new improved high-speed cutting blade, adjustable to depth and diameter.

Wedge-lock blade holder permits cutting edge to recede or yield from work while still maintaining steady pressure and feed.—**Bruno Tools, Beverly Hills, Calif.**

AUTOMATIC SPRAYING MACHINE

—Flex-Plane machine double sprays each square foot of surface evenly and completes work before drying and hair cracking can develop. Machines are made adjustable for single and two-lane construction. Single-lane units are adjustable from 10 to $12\frac{1}{2}$ ft.; two-lane units from 20 to 25 ft. Curing material can be sprayed the minute surface is finished. Gasoline engine delivers material under pressure to nozzle and propels machine.—**Flexible Road Joint Machine Co., Warren, Ohio.**

GENERATING PLANT — Compact, portable 110-v. a.c. 500-w. power plant comes equipped with push button right on generator with cutout, d.c. ammeter, charge control resistor and battery cables. One 6-v. auto-type



battery is required to furnish starting current. All plants have hand-starting facility. Unit is powered with 1-hp. single-cylinder Briggs & Stratton aircooled engine, 2-in. bore and 2-in. stroke. Size is 25x11x20 in. and net weight is 125 lb.—**Kato Engineering Co., Mankato, Minn.**

THE NEW GALION PORTABLE

NEW EFFICIENCY AND ECONOMY ON PATCHING AND ODD JOBS

This new GALION Portable Roller combines compact construction and easy portability with the compression effectiveness of a 5-7 ton tandem roller.

Construction has been simplified and ruggedness increased by the use of an extra-strong, single frame. All moving parts, including the powerful air-cooled motor are enclosed and protected by an attractively streamlined body. The improved truck-hitch has a convenient, built-in hydraulic lift for raising the roll off the ground for transporting from job to job.

Write for complete information and name of your nearest Galion Distributor.

THE GALION IRON WORKS & MANUFACTURING COMPANY

General and Export Sales Offices
Galion, Ohio, U.S.A.



This new GALION Portable Roller has the power, compaction, and economy of operation to make a countless number of your miscellaneous rolling jobs really profitable.

GALION

**You've got to be
GOOD
to wear it!**



● Like the Distinguished Service Cross, the AGC rating plate on a mixer or paver represents exceptionally meritorious service. For no mixer or paver can wear this symbol of quality unless it has earned the right. It is your assurance of guaranteed capacity and performance.

The AGC rating plate eliminates the guesswork about equipment. When you estimate a job, you know exactly what mixer and paver capacities are, right down to the last yard.

Why take a chance? Next time you buy, insist on equipment wearing the AGC rating plate. You'll find it pays!



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Affiliated with the Associated General Contractors of America, Inc.

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Port Washington, Wis.

The Foote Co., Inc.
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Yes, Schramm Air Compressors are available in a variety of sizes—all designed to meet the needs of construction and contracting engineers.

The overall picture is this. You get all the air you want with Schramm Air Compressors.

Specific features of Schramm Compressors are (1) 100% watercooled (2) forced feed lubrication (3) mechanical intake valve (4) compact, lightweight!

Illustrated are only three of many Schramm models. They range in size up to 600 cu. ft. displacement, and include stationary units as well as portable.

We invite you to write today for full details on Schramm Air Compressors. They offer you many savings because of their rugged design, their ability to give you air easily, economically!

SCHRAMM

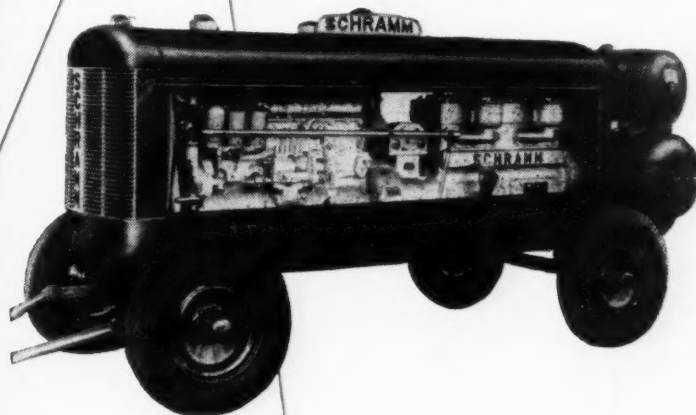
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THE COMPRESSOR PEOPLE
WEST CHESTER
PENNSYLVANIA

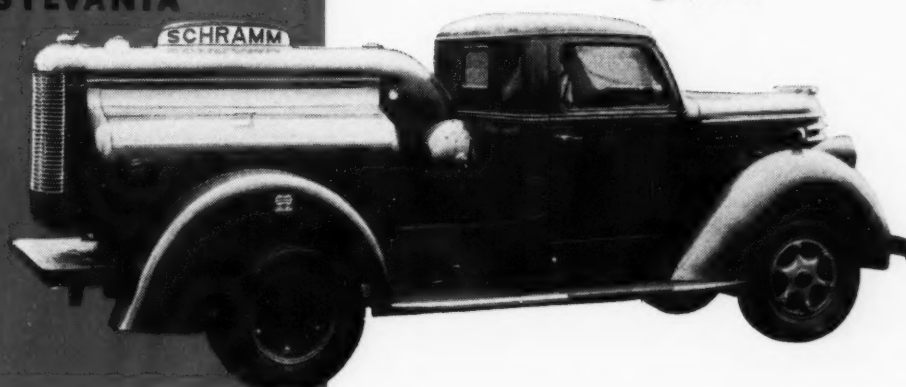


#60

WHAT SIZE
SCHRAMM
AIR COMPRESSOR
FITS YOUR NEEDS?



#315



#105

The RIGHT Answer to EVERY VIBRATOR PROBLEM in the Concrete Construction Field!



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Stick this in your hat for future reference: For each and every purpose to which Vibrators are applicable in the concrete industry, we can supply the equipment that will give you not only the best and fastest placement, but also the maximum of dependability and trouble-free service. Our long famous JACKSON line includes many vibrators of both the internal and external type; the finest equipment available for:

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ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON MICHIGAN

UNLOADING UNIT—New unloader is hydraulically operated by driver from his regular position. Two double-acting hydraulic cylinders move ver-



tical rack forward, pushing load off forks. Other applications of unloader are also possible, for its pulling power is equal to pushing power.—**Towmotor Corp.**, 1226 E. 152nd St., Cleveland 10, Ohio.

GUN-LOADER FITTING—Mounted on head of hand gun, this unit permits grease to flow into grease reservoir of gun in same manner that it flows into bearing through lubrication fitting in normal lubrication. New method eliminates disassembly of gun, precludes danger of lubricant contamination or waste, eliminates annoyance of air pockets in gun and permits loading in few seconds. Load—
(Continued on page 146)

Shunk Superior Quality BLADES AND CUTTING EDGES

For any make of machine
Motor Graders, Main-
tainers, Scrapers, Drags,
Bulldozers, Backfillers,
Wagon Scrapers, Trail
Builders, Trail Blazers,
Carriways, Also—

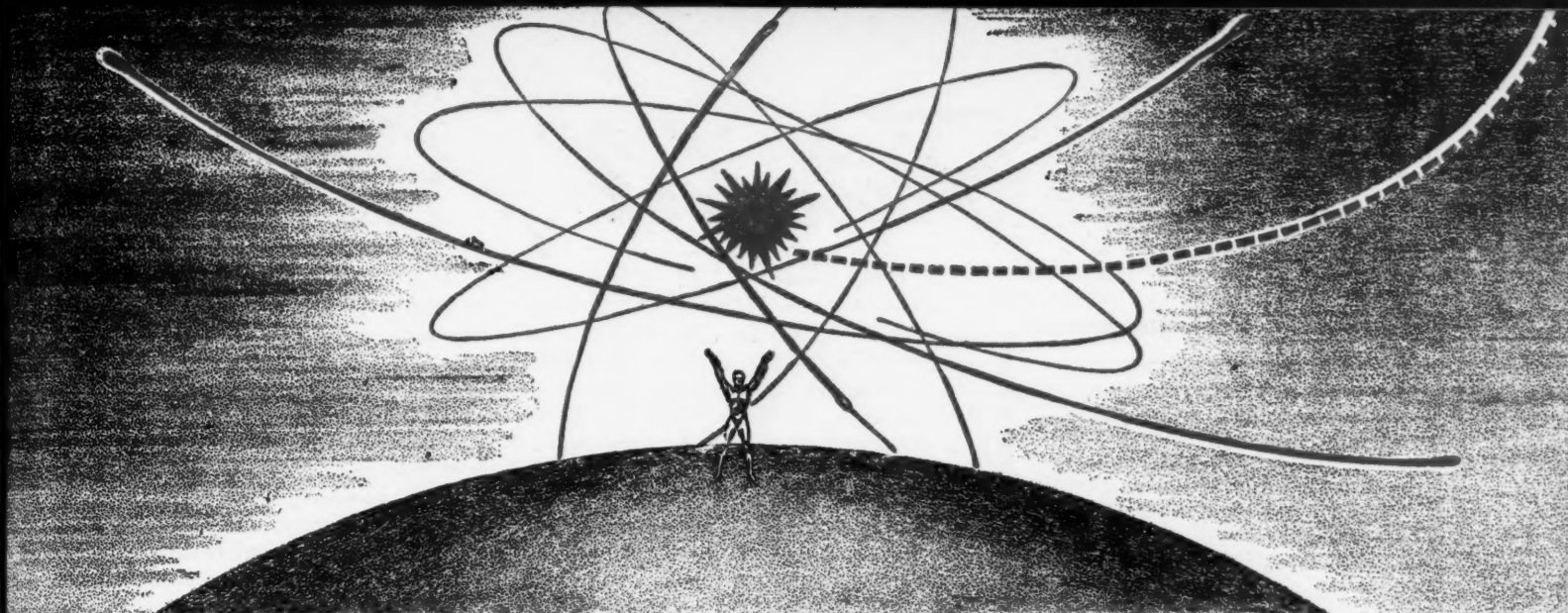
CUTTING EDGES
WEARING BOOTS
BACK SLOPERS
EXTENSION BLADES
MOLDBOARDS
and
SCARIFIER TEETH

50 years of manufactur-
ing blades has developed
for you a special steel,
milled through our own
rolls and forged at the
edges to give that extra
wearing quality you need.

All widths lengths, and
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ready to fit your machine.

Consult your internation-
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bulletins, giving type and
name of machines you
operate—get set for blades
early.

Shunk Member
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**MANUFACTURING
COMPANY**
Established 1854
BUCYRUS, OHIO.



MAN ^{vs} ATOM - YEAR 1

WHEREIN WE SIGNALIZE THE FIRST ANNIVERSARY OF THE ATOMIC AGE, CONSIDER THE ALTERNATIVES INHERENT IN BOTH GOOD AND EVIL POTENTIALITIES OF NUCLEAR FISSION, THEN VENTURE A GLIMPSE INTO THE FUTURE

A YEAR AGO, July 16, 1945, at Alamogordo, New Mexico, man created the first atomic explosion. Most impressive events diminish in stature as they recede in time. This one grows bigger with each passing day. It truly marked the beginning of a new age.

As Year 1 of the Atomic Age ends and Year 2 begins, we are engaged in three portentous projects.

At Bikini Atoll we are detonating the fourth and, possibly, the fifth atomic explosions in the history of the world.

At Oak Ridge, Tennessee, we are building the first atomic energy plant for peaceful purposes.

Most important, in New York we and all the other United Nations are engaged in the first attempt to subject atomic energy to international control. Literally, the fate of the world hangs on this attempt.

As this introduction is written, the United Nations Atomic Energy Commission has just begun its work. People everywhere pray for its success—for their own sake, but even more for their children and for their grandchildren. If this Commission fails let everyone everywhere be warned: the world has taken a step toward destruction.

As we enter the second year of the Atomic Age, the nations of the earth are embarked on an atomic armaments race. There is no blinking that fact. We have had official notice served on us. Therefore, we must understand that unless the United Nations Commission can

arrest the drift of events, we are moving toward a horrible war. The Commission must succeed.

The American delegate, Mr. Baruch, has brought to the Commission an ably thought out plan. It would internationalize nuclear science, and release for mankind the beneficent applications of atomic energy. But it would "control" atomic bombs only to the extent of giving the world brief warning of any nation's preparation to use them, so that we might have foreknowledge of disaster.

Therefore, the real and enormous task before the world becomes clear. We must end war. No other control of atomic weapons exists. If war comes, atomic weapons will be used. If they are used, our children who survive will curse their fathers. Understanding the consequences of failure, we *must* succeed.

Because we cannot succeed without knowledge, I have asked my associates at McGraw-Hill to condense into the following pages what we know at the close of Year 1 about this great new atomic force—its basic science, its possible uses and its political repercussions.

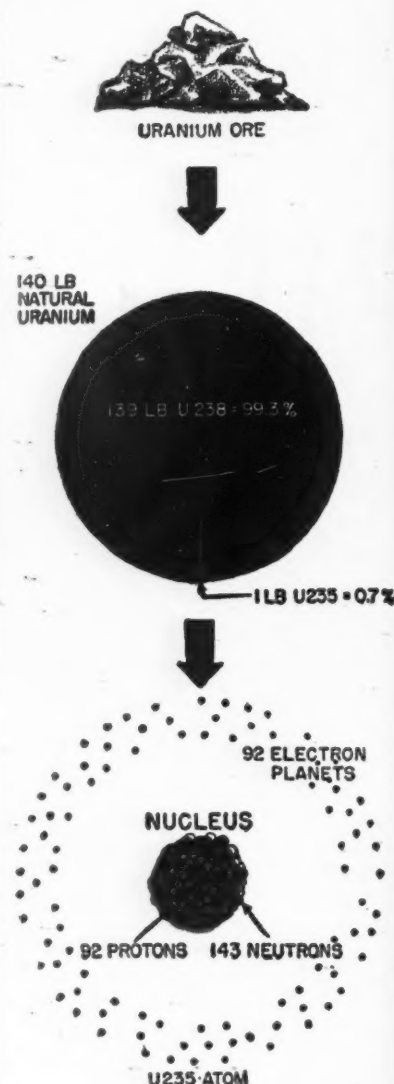
James H. McGraw, Jr.

President, McGraw-Hill Publishing Co., Inc.

This Fateful Atom...

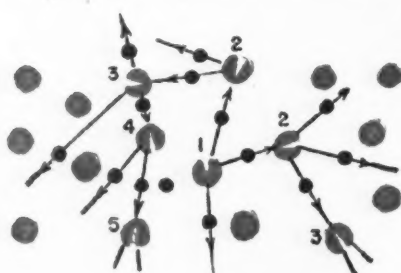
1 ORE TO U235

Only 0.7% of natural uranium is U235



2 CHAIN REACTION

Fragments from earlier nuclear explosions smash other nuclei



LOOKING BACK twelve months to the birth of Year 1, Atomic Age, we begin to sense the majestic import of the atomic bomb that blasted the naked desert at Alamogordo, N. M., on July 16, 1945. There man first shattered atoms in an explosive *fast-chain* reaction. Then came Hiroshima and Nagasaki.

In every case the fateful atom was either uranium 235 (U235), or plutonium derived from the action of U235 on U238. Every pound of U235 atoms split in these unprecedented blasts yielded the energy of 11.4 million kilowatt-hours, or 1400 tons of coal — slightly more for plutonium.

No matter where one mines uranium ore, the purified natural uranium (Fig. 1) always contains 99.3% of the "garden" variety U238, and a mere 0.7% of the precious U235.

An atom is like our solar system. The central sun is the nucleus—a bunched mass of protons and neutrons, each weighing one unit. The planets are electrons. Each proton has one plus electrical charge — each electron an equal negative charge. There must be as many negative electron planets as positive protons in the nucleus. This is also the "number" of the atom. Neutrons have no charge, but add weight.

The atomic number of uranium is 92 because the uranium atom always has 92 nuclear protons and 92 electron planets. The isotopes U238 and U235 differ only in the number of neutrons; U238 has 146 neutrons, and weighs $92 + 146 = 238$ units. U235 has 143 neutrons, and weighs $92 + 143 = 235$ units.

Ordinary chemical reactions, such as TNT explosions, release only a fraction of

the modest energy of the whirling electrons in the outer atom. Nuclear reactions unlock the immensely greater energies which bind together the nucleus.

Even the gentle tap of a slow-moving neutron bullet will split the atom of U235 or of man-made plutonium into two medium-weight atoms, yielding also one to three spare neutrons plus energy. Thus these *fissionable* materials supply both their own bullets and a highly sensitive lot of high-explosive targets — a perfect setup for a *chain reaction* (Fig. 2).

Chain reactions work like chain letters. Neutrons from one nuclear explosion hit and explode other nuclei. But, since atoms are mostly open spaces a chain started in a small block of U235 or plutonium quickly dies out because most of the released neutrons escape from the block.

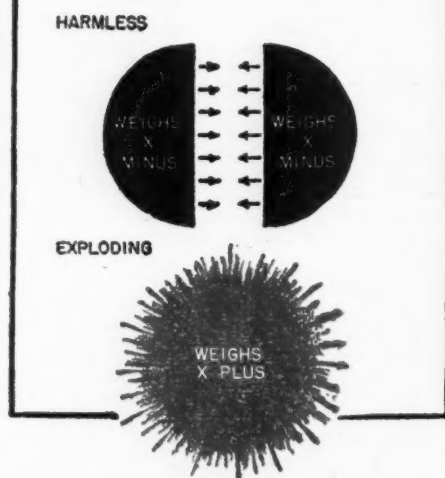
The bigger the block, the smaller will be the percentage of escaping neutrons, and the more left to split other nuclei. When the block is rapidly built up beyond a certain secret size the fragments of 1000 nuclear fissions split many more than 1000 additional nuclei. Then fissions multiply geometrically, and the block disintegrates with explosive speed and violence — as in a bomb (Fig. 3).

This bomb explosion is a fast-neutron chain. For economy and ease of control, uranium piles for the gradual release of nuclear energy for commercial purposes will normally use a lean fuel—that is U235 or plutonium diluted with U238, thorium or other less costly materials.

To maintain a chain reaction such piles must be large and artificially stimulated by using carbon blocks or some other *moderator* (Fig. 4) to slow many of the neutrons. Slow neutrons make more hits than fast neutrons because there is more time for them to be swerved from a straight path by the attraction of nearby nuclei, as shown below.

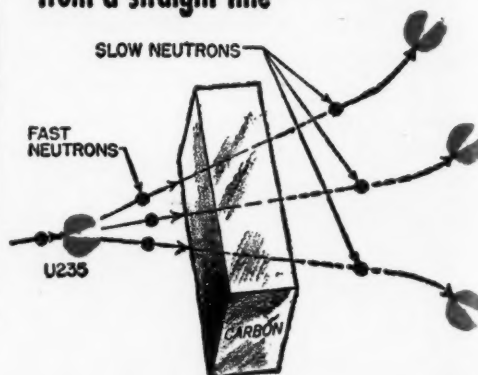
3 WHY BOMB EXPLODES

When block of rapidly assembled U235 passes secret critical size it explodes spontaneously



4 SLOW NEUTRONS MAKE MORE HITS

A slow neutron is more easily swerved from a straight line



can Serve Man...

THE FATEFUL U235 ATOM can serve man as a new, compact source of heat energy for power generation, comfort heating or industrial processing. Peacetime applications of atomic energy will use dilute U235 or plutonium as a "fuel," mixed with carbon or some other moderator to slow some of the neutrons and thus keep the chain reaction going.

The diluting agent may be either U238 or thorium, or both. These will do double duty, because neutron bullets convert U238 into the energy-yielding plutonium, and thorium into U233, which may prove equally serviceable.

Thus the commercial piles of the future will "burn" U235 to make other atomic fuels, plutonium and possibly U233, which in turn will deliver heat energy to the pile. In that way it will be possible to get from the pile far more heat than the equivalent of 1400 tons of coal for each pound of U235 split. This highly attractive prospect will speed the day when nuclear energy can compete with coal.

While already mechanically obsolete, the piles making plutonium for bombs at Hanford, Wash. (Fig. 1) reveal the basic principle on which future piles for power and heat will operate. The heat now wasted in vast quantities will be put to work. The plutonium, now removed for bomb manufacture, will be returned to the pile (or left in) as supplementary fuel.

ATOMIC POWER

The possible everyday applications of nuclear heat pictured in Fig. 2 have been recognized from the very first day of the Atomic Age. Year 2 will see the building of the world's first atomic power plant (a pilot plant) at Oak Ridge, Tenn.

Beyond question such installations will produce power, but it may be years or decades before they prove economical. To compete with conventional plants the piles must first be redesigned to run at temperatures high enough for good power-plant efficiency. Also the techniques of operating piles by remote control through the heavy radiation screens must be radically streamlined.

The Hanford piles run on natural uranium containing only 0.7% of U235. The typical commercial atomic power plant of the future will use more than 0.7% of U235 or plutonium, but less than 50%. This will avoid both the low efficiency of the too-lean mixture and the excessive fuel cost of the rich mixture. It will permit piles of moderate size and take maximum advantage of U238 and thorium as potential sources of plutonium and U233.

One should not expect U235 to replace coal generally in this generation, although a few central power stations and ships will

try it out before Year 10 of the Atomic Age. Plants far from traditional sources of fuels may turn much sooner to uranium and thorium as concentrated heat sources, that may easily be transported even to remote corners of the earth.

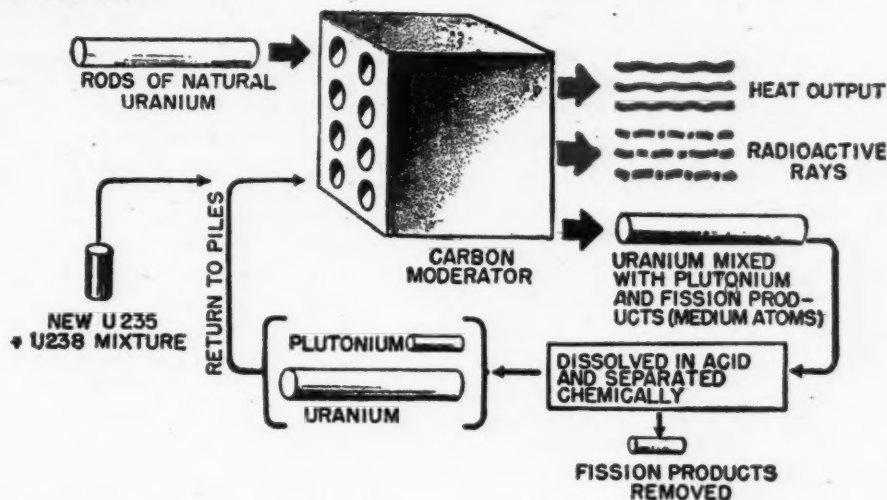
Atomic power, in forms now known, is impracticable for automobiles and small airplanes, because of the large initial investment in uranium and the need to carry 50 tons of shielding to protect riders and pedestrians against the deadly radioactivity accompanying nuclear fission.

RADIOACTIVE ISOTOPES

More immediately important than the heat and power applications of nuclear energy are the services that the radioactive byproducts of pile operation can render. Because these materials act chemically like their ordinary non-radioactive cousins, but can be followed and detected easily, they are expected to play tremendously vital parts in medicine and biology. For more details, see the last page of this section.

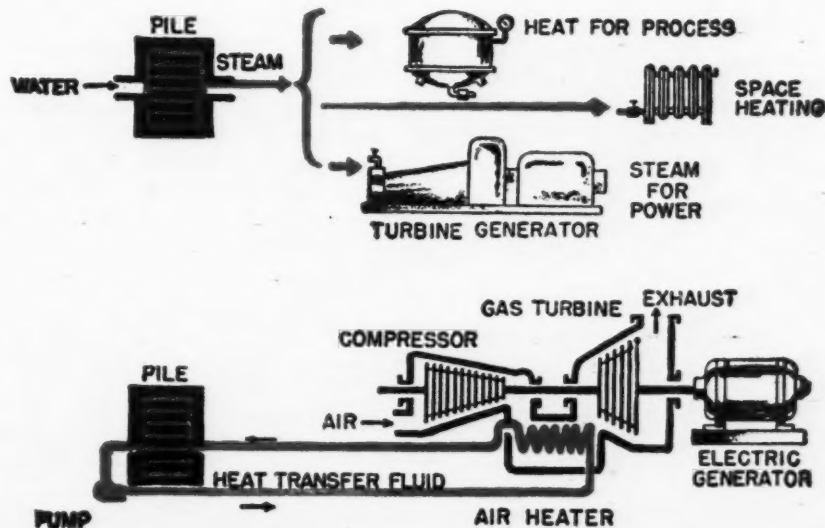
1 SLOW-NEUTRON PILE

Can make plutonium for bombs—or heat for power, process and comfort



2 PRACTICAL APPLICATIONS

Include steam for turbines, process and comfort heating—also heat for gas turbines



or Destroy him . . .

URANIUM 235 and plutonium are now man's slaves. They will build or destroy as he orders. Man dreads this vast force only because he distrusts himself. War is proof that man in the mass has never achieved self-control. He has always sought better weapons; yet the perfect weapon now brings him no satisfaction for he sees in the atom bomb his own destruction as well as that of his enemy.

The ultimate benefits of nuclear energy may well surpass its present terrors, but the terrors are here now in awful dimension, and man must face them. He must pay this price for unlocking the wealth of the inner atom.

ATOMIC BOMB

This page, then, is about the atomic bomb. Nothing will be said here that is not either a certified scientific fact or a conclusion shared by the majority of the leading scientists, engineers and statesmen who have studied the matter.

As already explained, an explosive nuclear chain reaction spontaneously sweeps through a block of U235 or plutonium when the block is rapidly enlarged beyond a certain "critical" weight X. That weight is still a military secret; the official Smyth

report vaguely suggests that it is more than 4 lb and less than 200 lb. Each piece of U235 in the dormant bomb must weigh less than X. At the desired instant of explosion the bomb mechanism assembles these pieces rapidly into a single piece considerably heavier than X.

The explosion itself drives the U235 pieces apart, thereby quenching the atomic conflagration before all the atoms are split, so the bomb efficiency is far less than 100%. For each pound of U235 (or plutonium) atoms actually split, the bomb releases the energy of 1400 tons of coal.

This explosion is mainly ordinary heat at work in unprecedented concentration. Bomb metals become incandescent vapor millions of degrees hot. This, and the enveloping sphere of glowing air, radiate a blinding flash that chars human flesh at half a mile and blisters at over a mile. There is a destructive shock wave (sound) and a second-long hurricane of unimaginable force — the outrushing of the expanding heated air. Deadly neutrons and gamma rays speed out from the bomb.

A single atomic bomb killed about 100,000 at Hiroshima. Fewer died at Nagasaki only because the circle of potential destruction included much vacant land. Bombs ten times more powerful can be made by the thousands in any major industrial country with the plants and the know-how. One bomb could saturate Minneapolis or downtown Manhattan.

Many experts estimate that a complete set of American atomic "secrets" and blueprints might save a foreign power two to three years at best in its race for atomic arms. With no help at all from us, any advanced industrial nation can, in five to ten years, acquire the raw materials, the plants, the know-how and enough bombs to knock out the big cities of any other country overnight. In Year 2 of the Atomic Age this arms race is already on.

It will not fail for lack of raw materials; every country has lean ores worth working for bombs.

THE CHEAPEST DEATH

Cost need not deter, for the atomic bomb is by far the cheapest method of destruction ever devised. General H. H. Arnold estimates that atomic bombs can be manu-



A single improved atomic bomb can devastate ten square miles of city

factured and delivered for less than \$500,000 per square mile of destruction.

Don't be misled by the two billion dollars America spent on a project that dropped only two bombs on the enemy. New plants can be built at a fraction of wartime cost, and the investment spread over thousands of bombs, not just two.

NO DEFENSE

So the bombs can be made in ample quantity and paid for, but can they be delivered? The answer is: "Yes; by the time the bombs are ready they can be delivered anywhere and overnight." If the defenses of the target country are weak, piloted planes can get through in ample number. Ten percent would be enough.

For more effective delivery radio-steered pilotless planes and rockets can carry the atom bombs faster than sound. Such weapons will be almost untouchable by either antiaircraft artillery or manflown fighters.

Greatest threat of all will be the transoceanic rockets. The German V-2 rocket, which never once was stopped by Britain's defenders, points one way. It needs only transatlantic range (with atomic propulsion) and an atomic bomb in the nose. Forty-six feet long, loaded with 7500 lb of alcohol fuel and 11,000 lb of liquid oxygen, the V-2 of World War II rose 60 miles in the air and arced 200 miles in five minutes to deposit one ton of TNT in London.

Seeing so many strange things come to pass, the man in the street cannot distinguish between possible miracles and the impossible variety. From the very start of the Atomic Age he has been hoping for a "ray" that will explode the atom bomb far off. Competent scientists and engineers say that cannot be.



There is no known defense against the atomic rocket attacking at mile-per-second speed

The only way to bring down a 3500-mile-per-hour rocket at a safe distance is to chase it with your own 4000-mph rocket. You can't win at this game often enough to establish ironclad protection.

The only specific defense against the atomic rocket known in Year 2 of the Atomic Age is to disperse all cities and put key industries underground. This would be very costly in time, money and national morale.

MORE AND BETTER BOMBS?

Some will ask whether the U.S., as the most powerful industrial nation, could not build more and better bombs and carriers than any other nation. Probably yes, but there is still no real security. If the "weak"

opponent has enough atomic weapons to destroy us once, what advantage is there in being able to destroy him twice?

Shooting first could protect us now, but not after the world is atomically armed. If we were to destroy the enemy's cities, we would probably miss his well-concealed and protected bomb magazines and rocket launchers. A few minutes later he could return the atomic fire. In brutal simplicity, that is the picture of future atomic war. Everybody loses.

At this point one grasps at another straw: "If everybody is to lose who would be so foolish as to start an atomic war? And didn't the Germans refrain from using gas for a similar reason?" Possibly yes. It *may* work that way. But in a world

atomically armed to the teeth some nervous finger *may* pull the fatal trigger.

ONLY ONE WAY OUT

Throughout history each new offensive weapon has called out its appropriate defense. But now the offense leaps centuries ahead in a single bound and the defense lies almost helpless everywhere, unless some technical protection, unknown as Year 2 begins, can be devised.

The situation is extremely dangerous. There is no clear way out except through some sort of international action first to stop the atomic arms race and, before it is too late, to hobble war itself.

Can it be done? Perhaps not, but there is no alternative except atomic chaos.

...so he faces the Atomic Dilemma...

THE NUMBERED statements that follow in somewhat logical pattern are too fateful to be accepted on anybody's say-so. Every reader should test them in the light of his own information and understanding.

The points below sum up the conclusions of the previous article — and these in turn reflect a great mass of thought and discussion among leading scientists, engineers and statesmen close to the problem. To an amazing degree they concur on both facts and conclusions. For authoritative statements of their line of thought, in detail not possible here, the reader should see the recent book, *One World or None*.

THE DILEMMA

Nations must either face the probability of an atomic World War III, which would surely be the most deadly in history . . .

Or, the experts propose, yield both atomic weapons and war potential to international authority backed by superior force.

What the Experts Say

1. In five to ten years any major industrial nation can make enough atom bombs to destroy all the major cities of any other country overnight.
2. This assumes no "secret" information or other help from us.
3. The necessary uranium ores will be at hand.
4. The cost will not be too high.
5. The bombs produced can then be carried thousands of miles by bombers, or by atomically powered guided missiles moving faster than sound.
6. There will probably be no effective military defense against such weapons.
7. Dispersing cities, and putting key industries deep underground, will give some protection if accomplished in time,

but at incredible cost in money and human discomfort.

8. In a world atomically armed, nations can probably protect their bomb stocks and rocket launchers from enemy assault.
9. If so, nation A can destroy the cities of any other nation B, after which B's rockets will destroy the cities of A. Shooting first will not win an atomic war.
10. This knowledge may not restrain the trigger finger of a suspicious power.
11. Having more and better atomic weapons than the other fellow won't help much if he has enough to destroy us. No use to kill a man twice or rebomb urban ruins.
12. Every nation is vulnerable in the Atomic Age, including the U. S. A.
13. National security will be impossible without (first) international control of atomic arms and (not too long there-

after) international control of all war potential, both backed by superior physical power.

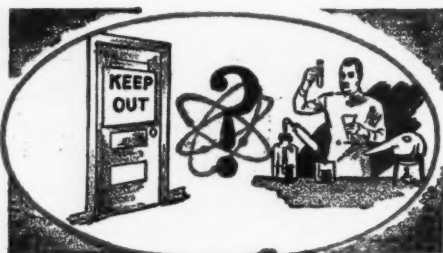
14. If action to this end is long delayed, it may become impossible to halt the atomic arms race already started.
15. At best, the necessary degree of international control, with some real delegation of national sovereignty, will be a revolution in human affairs. It may prove to be humanly unobtainable at this time. If so, men and women everywhere must face the probability of an atomic third world war—by far the most destructive in all history.

In this atomic age no nation can be safe through its own unaided might



...and the Great Debate unfolds

ATOM YEAR 1 has probably been marked by more debate on a single subject than any other twelve months in the world's history. Social, economic and political as well as purely technical issues have been pressing for realistic solution. Let us look at these issues and see where we stand:



SECREC Y VS. FREE SCIENCE

Throughout the first year of the Atomic Age hot debate has raged around "keeping the secret of the bomb." To prevent potential enemies from making atom bombs some have urged a complete black-

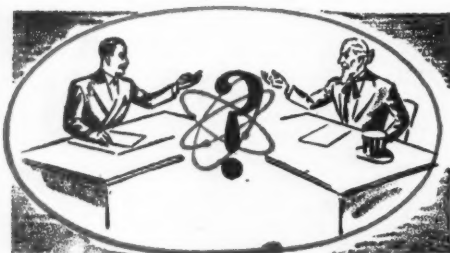
out of all phases of atomic energy — even of the scientific fundamentals of nuclear physics. Others have sought immediate and complete disclosure of all bomb "secrets," both scientific and technological. These have held that such information cannot be effectively hidden, that secrecy blocks progress and breeds wars.

A year of debate has brought the great mass of vocal opinion to this middle ground: (1) Ease restrictions on the exchange of basic physical knowledge. (2) Release for industry's benefit many of the devices and methods developed for the bomb project. (3) Hold tight to specialized information on atomic bombs and bomb-material production until international safeguards are fully operative.



CIVILIAN VS. MILITARY

Because the atomic bomb is the world's greatest weapon, the armed forces would like to control it. But because atomic energy can also be used for peaceful, beneficial purposes, civilian control seems equally essential. These conflicting viewpoints had their strong proponents before the Congress which finally reached a fairly satisfactory compromise in the Atomic Energy Bill of 1946, setting up a competent civil board with which the armed forces will have continuing liaison. As we go to press, just before Year 2 of the Atomic Age begins, this bill has passed the Senate, but there is still a question how rapidly it will be enacted into law.



PRIVATE VS. PUBLIC

Atomic energy is "too big" and "too hot" to be handled privately. It must be nationalized and internationalized. The questions are *how* and *to what extent*. Fortunately, as the "boxes" on these pages show, there are means that may attain reasonable safety against misuse of the atom, and still do so without public control of many "non-dangerous" applications,

DOMESTIC CONTROL AS PLANNED IN THE ATOMIC ENERGY BILL OF 1946

McMahon Committee Bill contains the following provisions.

Policy. Declares it the policy of the U. S. to develop and utilize atomic energy to improve the public welfare, increase living standards, strengthen competitive enterprise and promote world peace,

Organization. Establishes the Atomic Energy Commission (AEC) of five administrators to direct four divisions on research, production, engineering, and military applications—to work in liaison with three committees from (1) the armed forces, (2) outstanding civilians, and (3) joint Congressional representatives.

Production. AEC to own and operate (under management contracts with industry if deemed desirable) all facilities for the production of fissionable materials, such products to be distributed with their radioactive byproducts under license for private industrial and medical research.

Military Application. AEC to engage in development work and produce atomic bombs as directed by the President, to be delivered only on his order to the Armed Forces.

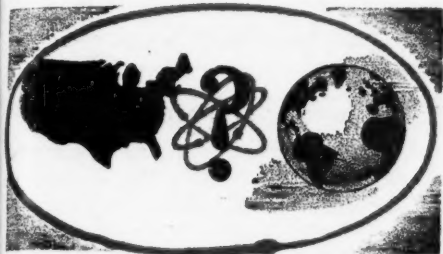
Industrial Utilization. Permits AEC to conduct research, design and manufacture equipment for atomic-energy utilization, license its use, produce and sell power obtained as a byproduct in the production of fissionable materials. Directs AEC to give widest safe scope to private initiative.

Control of Information. AEC to enforce a ban on the dissemination of restricted data that might be used to injure the U. S. or secure advantage to a foreign nation, yet to provide leeway for ultimately relaxing restrictions as future conditions warrant.

Patents and Inventions. No private patents permitted for production of fissionable materials or their utilization for military weapons, but AEC will justly compensate for such inventions, when made by private citizens. Patents for non-military applications may be purchased or condemned by the AEC only when public interest is affected.

Appropriations. "Such sums as may be necessary and appropriate to carry out the purposes and provisions of the act" *plus* unexpended funds of the Manhattan Engineer District.

while Time runs out



NATIONAL VS. INTERNATIONAL

Born of nationalism, the Atomic Age began when three nations discovered a weapon that today gives them the greatest military power on earth. The prime question is: Shall the atom remain the

servant of its conqueror, nationalism?

During Year 1 of the Atomic Age the Truman-Atlee-King declaration, the masterly report of the State Department's atomic consultants, and the U.S. representative on the United Nations Atomic Energy Commission, have all called for international control of atomic energy. Year 2 will start with no such control. This failure to decide and act is in part a natural result of the extreme difficulty of the problem and the obvious dangers of unwise decisions. Nations everywhere face a triple dilemma in this Atomic Year 2: the dangers of nationalism, the dangers of internationalism, the supreme danger of not being able to make any decision in time to meet the atomic bomb threat.

INTERNATIONAL CONTROL AS PROPOSED BY THE U.S. TO U.N. ATOMIC COMMISSION

Baruch statement follows constructive path laid out by Atomic Consultants in "Acheson-Lilienthal Report."

The Plan. The U. S. has proposed that all nations band together to outlaw the use of atomic energy for war and to promote and harness its development for the benefit of mankind. To this end an International Atomic Development Authority would be set up, and to it the U. S. would turn over, at various stages of its organization, all atomic bombs, know-how, raw materials, facilities, and stockpiles of fissionable material. Thus IADA eventually would supersede national authorities on some matters and supplement them on others.

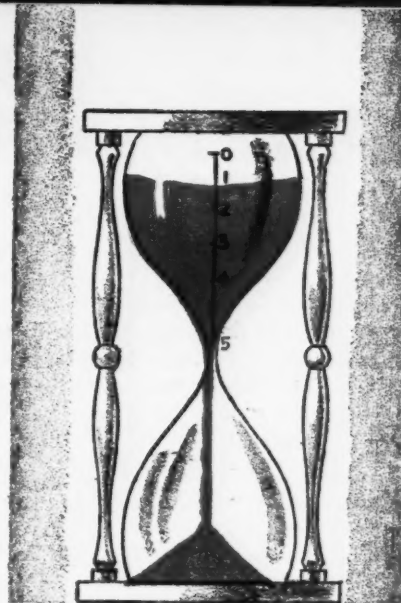
Owner and Operator. IADA would take over from national authorities or private ownership full management and control of all atomic energy matters that afford a possible threat to World security. These include:

1. Raw Materials—Supplies of uranium and thorium to be inventoried, controlled, and developed by IADA.
2. Facilities—IADA to control and operate plants producing fissionable materials and to own and control their products.
3. Research—IADA to undertake research and development on all aspects of atomic energy and to possess exclusive right of research on atomic explosives.

Private Initiative. Will have its chance to push forward the use of atomic energy for peacetime (non-dangerous) purposes. With IADA providing raw materials and carrying out necessary inspection, national and private enterprise may operate "safe" power piles, and produce and use radioactive isotopes for research, clinical and other applications. Radioactive isotopes produced by IADA also can be distributed for peacetime use.

The Mechanics of Safety. No plan is a certain guarantee against future atomic war. This plan should, however, prevent surprise attack with atomic weapons; for IADA is to buttress positive ownership or management controls with wide powers of inspection. Obviously, successful inspection rests on complete freedom of access or egress in any area.

Sanctions. At the heart of the plan lies the problem of penalty for violation—a matter for profound statecraft. To the U. S., one aspect of sanctions appears crystal clear: Here is an area where the veto right now held by the five great Powers must be redefined if it is not to be incompatible with the meaning and purpose of the proposed control.



Leading industrial nations can produce atomic bombs in five years, competent scientists announced after Hiroshima. Already one year of the precious five has been consumed in debate without international action. Soon it may be too late to check the growing momentum of the atomic arms race.

TIMETABLE—ATOM YEAR 1

1. July 16, 1945. World's first atomic bomb detonated in New Mexico.
2. July 26, 1945. President Truman and Prime Minister Churchill issue Potsdam ultimatum threatening Japan's destruction if she continues.
3. August 6, 1945. Atomic bomb dropped on Hiroshima.
4. August 9, 1945. Atomic bomb hits Nagasaki.
5. August 11, 1945. Army releases Smyth Report on "Atomic Energy for Military Purposes."
6. August 14, 1945. Japan accepts terms of Potsdam declaration.
7. November 15, 1945. Truman-Atlee-King issue declaration of intention and procedures looking toward international control of atomic energy by United Nations.
8. March 28, 1946. State Department issues Acheson-Lilienthal Report on the "International Control of Atomic Energy."
9. April 12, 1946. Manhattan Engineer District announces program for experimental development of atomic power.
10. June 1, 1946. "Atomic Energy Bill of 1946" passes Senate unanimously, is referred to House of Representatives.
11. June 14, 1946. First meeting of United Nations Atomic Energy Commission (Bernard Baruch as American member). Manhattan District announces availability of radioactive isotopes for research use.
12. July 1946. Joint Army-Navy tests of atomic bombs at Bikini.

...but if Man Masters Atom.

IF MUTUAL DESTRUCTION by the atomic bomb can be avoided, the first century of the atomic age will bring immense advances in scientific knowledge, health and living standards. Already many prospective benefits can be outlined, but those we can neither foresee nor suspect may be even more important.

This prediction is grounded in scientific experience; the most fundamental discoveries have always been the most fruitful. The study of molecules gave us chemistry. Faraday's experiments with electricity and magnetism are the foundation stones of the great electrical industry. Can one expect any less from an understanding of the heart of every atom?

BENEFITS

Atom-splitting benefits clearly visible today fall mainly in three classes: (1) heat and power applications of the uranium piles; (2) general industrial applications of equipment and methods originally developed for the bomb project; (3) chemical, biological and medical uses of the "tagged atoms" (radioactive isotopes) now abundantly available from pile operation.

It is now evident that the energy yield of the U235 in an atomic pile can be multiplied many times by returning to (or leaving in) the pile the plutonium and possibly the U233 produced respectively from the U238 and the thorium in the pile. This is an indirect way to "burn" inexpensive U238 and thorium, and thus greatly extend the supply and reduce the cost of atomic fuels.

POWER APPLICATIONS

Although present piles run at low temperatures, it is certain that temperatures high enough for the efficient operation of steam and gas turbines will be attained. Already an experimental atomic power plant has been ordered. Atomic power for certain remote installations (say, for heating Arctic airports) may not be far off.

In five or ten years uranium piles will be driving a few experimental ships and submarines. In 20 or 30 years uranium may begin to compete widely with coal as a fuel for suitably situated large central heating and power plants. The 50-ton minimum weight of shielding rules out nuclear power for automobiles and small piloted planes.

SPECIAL USES

Some day ultra-high temperatures from splitting atoms will be used for special industrial operations on metals and other materials. Even the dread atomic bomb might easily serve peaceful ends — blasting lakes in deserts, changing the course of rivers, leveling mountains.

INDUSTRIAL BYPRODUCTS

The special industrial equipment and methods developed for the bomb project will find hundreds of important uses — mostly for purposes unrelated to atomic energy. These developments include pumps with neither seals nor leaks, leak detectors of amazing sensitivity, ultratight welding, a portable mass spectograph for quick and automatic gas analysis, new ways of handling corrosive and poisonous materials, new diffusion barriers for the separation of gases and of petroleum products.

TAGGED ATOMS

Yet more important than any of these, in the long run, will be the hundreds of radioactive isotopes now available as by-products of pile operation. Chemically indistinguishable from the ordinary forms of the elements, these isotopes serve as tagged atoms or "spies" if mixed with common stable atoms of the same species. They "fly with the flock," and can later be identified as surely as banded birds. With these amazing tools of research, the course of any element or compound may be traced through the bodies of men, animals and plants. Similarly, tagged atoms

may be used in studying the course of many kinds of industrial and chemical operations.

BIOLOGY AND MEDICINE

A suspected hyperthyroid condition can be diagnosed by feeding the patient a minute measured amount of radioactive iodine. The click of a "Geiger" counter placed on the patient's neck will tell (1) what percentage of the swallowed iodine concentrates in the thyroid cells and (2) how rapidly that concentration is accomplished — giving a definite indication of the state of the gland.

In similar fashion the radioactive isotopes of hydrogen, oxygen and carbon will trace out the intricate transformations of carbohydrates and proteins in the human body. Radioactive phosphorus will explore the bones. Radioactive iron will show how and where blood cells are formed. Radioactive sodium will time the circulation of blood.

USES IN INDUSTRY

In chemistry the radioactive isotopes will speed the understanding of metallurgical and organic reactions. In industry they will measure flow, detect leaks, and do other useful work.

Meanwhile the uranium piles will be manufacturing certain radioactive isotopes that can serve as cheap but effective substitutes for high-cost medical radium.

KNOWLEDGE COMES FIRST

It is already clear that the chief benefits of atom splitting will come first as new scientific knowledge rather than as new engines and gadgets. But in the long run man's new understanding of the inner atom will enrich the whole range of human activity. This has always been the case with less fundamental discoveries in science. It can hardly be less with this most fundamental discovery.

ATOM SPLITTING WILL SERVE MAN IN:

CENTRAL POWER PLANTS



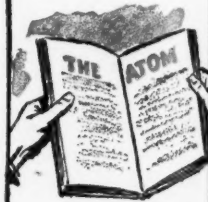
GIANT BLASTING OPERATIONS



MEDICAL DIAGNOSIS AND TREATMENT



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SHIP POWER PLANTS



BETTER INDUSTRIAL PROCESSES



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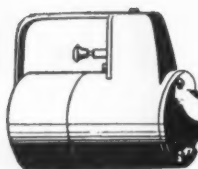
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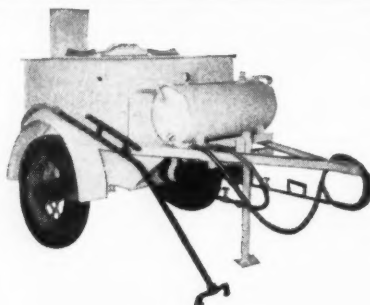
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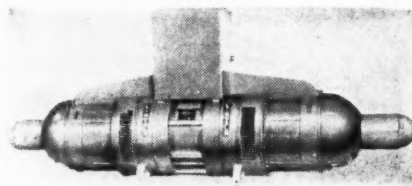
INDIANA



(Continued from page 144)

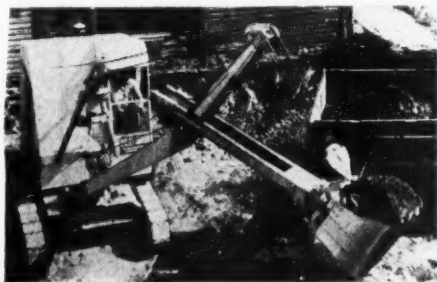
er valve mounted on bucket or loader pump functions in same manner as coupler does when applied to fitting. Several hand guns, both push-type and lever type, as well as loader pumps of 25-, 35-, 100- and 400-lb. capacity are equipped with special fittings and facilities required by new gun loading system. Loader valve, No. G-306740, to convert present guns to loader operation can be installed in either lever or push-type guns by drilling and tapping $\frac{1}{8}$ -in. pipe thread. Loader kit contains all necessary parts to convert any bucket pump into loader and includes one loader fitting for hand gun.—**Alemite Division, Stewart-Warner Corp., Chicago, Ill.**

1,200 AMPERE WELDER—New welder of 1,200 amp. comprising two 600-amp. generators, close-coupled to a c. induction motor and equipped with complete motor control is announced for use with "lincolnweld" process of automatic metallic shielded arc welding. Unit is of arc welded steel, drip-proof construction and is completely



wired. Generators are of variable voltage type with completely laminated magnetic circuits (frame and pole pieces) and equipped with interpoles. This welder consists of two equally rated generators with their output leads paralleled in control box by means of copper jumpers between studs of like polarity. One terminal is marked "Electrode" and the other marked "To Work." Copper jumper on positive (polarity) side is made removable.—**Lincoln Electric Co., Cleveland, Ohio.**

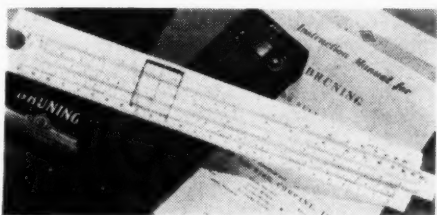
LIGHT $\frac{3}{8}$ -YD. EXCAVATOR has partial swing operating advantages. Weighs only $8\frac{3}{4}$ tons complete and has 37.5-hp. industrial-type motor. Operator and all working machinery are located on non-weaving 14-in. deep structural main frame and do not



swing with boom. Gears, clutches, drums and shafting are set low on main frame, resulting in low center of gravity and resistance against tipping. Other features are fully inclosed cab, new dipper trip, worm and gear boom hoist, oversize clutches all of same size with interchangeable linings and self-cleaning crawler treads.—**The Byers Machine Co., Ravenna, Ohio.**

SOCKET SCREW KEY KIT—All bits required for job can be carried in plastic, non-shatterable, lightweight handle of Hallowell kit. Model No. 25 is 5 in. long and has $\frac{7}{8}$ -in.-dia. handle, while No. 25 is $7\frac{1}{4}$ in. long with $1\frac{7}{16}$ -in. handle. Six 12-pt. hexagon sockets ranging in sizes from $\frac{3}{8}$ - to $\frac{3}{4}$ -in. socket openings are carried in No. 100 socket wrench kit, while No. 75 carries four 12- and two 6-pt. sockets. Swivel chuck can be set in any one of five positions. Hallowell tool kit accessories include ratchets, adaptors, universal joints and extensions.—**Standard Pressed Steel Co., Jenkintown, Pa.**

PRECISION SLIDE RULE—Made of plastic material that assures dimensional stability, new 10-in. slide rule has C1 scale which shows numerals and graduations in red for easier reading. A, B, C, D, K, S, L and T scales are also marked. Beveled

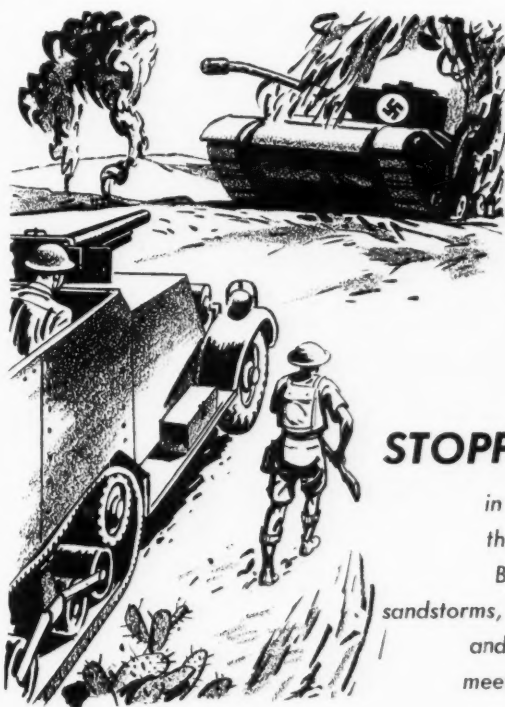
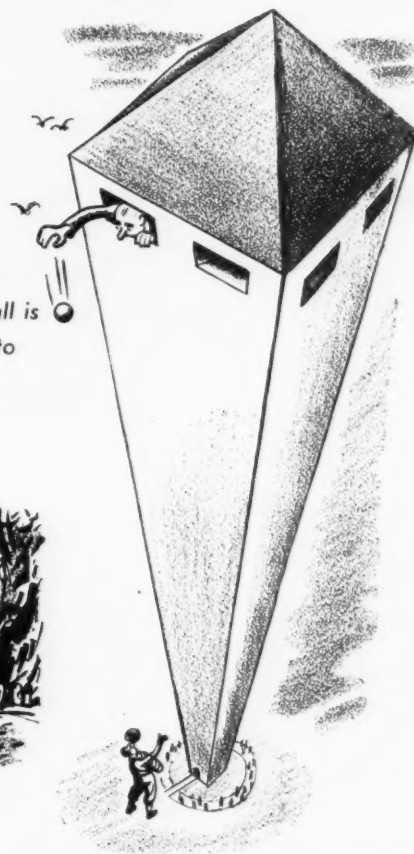


edges are graduated in inches and centimeters. Glass indicator is inclosed in stainless steel frame which holds it firmly in place. Tension of slide is easily adjusted by four screws on back of rule. Rule comes complete with sturdy protecting case and book of simple instruction.—**Charles Brunning Co., Inc., 4754 Montrose Ave., Chicago 41, Ill.**

Famous Stops

STOPPING A BASEBALL

dropped from the 555-foot Washington Monument is really a fast one! (The ball is hitting 185 ft. per second . . . is subject to tricky wind currents.) It was first done by a Big League catcher in 1908.



STOPPED AT EL ALAMEIN

in June, 1942, Rommel failed to breach the last fortification before Alexandria.

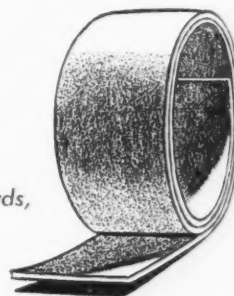
By winning this battle, fought in heavy sandstorms, the British saved the vital Suez lifeline and prevented a giant Nazi pincers from meeting in the Middle East.

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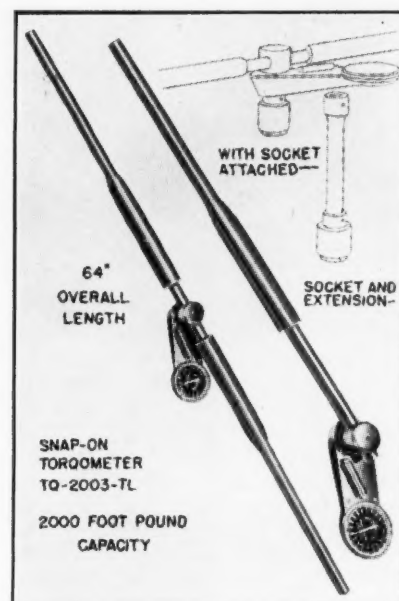
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Welded Steel Construction!
WELLMAN
Williams Type **BUCKETS**

• The best type of bucket construction is welded rolled steel. Wellman Williams buckets are so built—a pioneering Wellman achievement. You get sturdier buckets, less breakage, better service at lower cost!

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TENSION WRENCH—New T-type Torqometer gives adaptability, power and accuracy for all big nut-tensioning operations requiring tensions up to 2,000 ft. lb. It can be used as double or single-handle tool and two handles provided can be securely locked to main unit or quickly and



easily removed. Large 4-in. dial and pointer are adjustable to position giving easiest readability. Flash signal lights when exact required tension is reached. Complete unit weighs 30 lb. All exterior parts have gun metal finish. Any socket wrench with 1-in. square drive can be used with this model. — Snap-on Tools Corp., Kenosha, Wis.

BUILT-IN COUPLING—Ten-second joining and disconnecting of individual sections of Spiratube flexible tubing is made possible by new coupling which is built into tubing, eliminating need of fittings. Coupling, a flat spring steel collar, may be compressed to slip inside end of another section and then released to form strong, tight joint. Sections are easily dis-



connected by compressing inner spring steel collar and withdrawing male end. Couplings, like rest of tubing, are covered with long-fiber duck fabric which has been processed fire-resistant and coated with tough, durable plastic. There is no exposed metal inside or out which eliminates sparking hazards. Spiratube is furnished in standard diameters from 3 to 16 in. and in lengths of 10, 15 and 25 ft.—Spiratube Division, Warner Brothers Co., Bridgeport 1, Conn.

INDUSTRIAL SAFETY EQUIPMENT

Safety goggles, gloves, mitten, cover-mitt, hand pads, sleevelet, finger cots, spats and ladder shoes are among new equipment available. Goggles include Duraweld goggle for welders;



Duralite goggle for eye protection against flying objects; chemical and dust goggles; and Fits-on goggle for protecting spectacle goggle lenses from pitting and scratching. Gloves include open-back type for women who perform light assembly and bench work; all-purpose glove for women workers; heat glove for jobs requiring hot handling; welder's

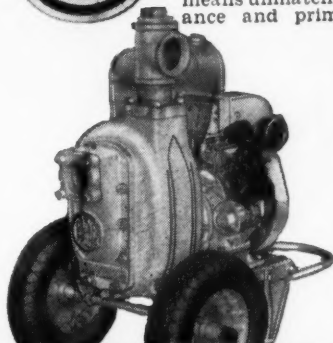
(Continued on page 150)



They Can Take It
DUAL PRIMERS



When it comes to DURABILITY, CMC Dual Primers have the "guts" to stand up to those tough, steady 24-hour grinds. DUAL PRIME means unmatched performance and priming speed.



CONSTRUCTION MACHINERY CO.
Waterloo, Iowa

Mixers • Pumps • Hoists • Batching & Placing Equipment • Saws • Carts • Barrows

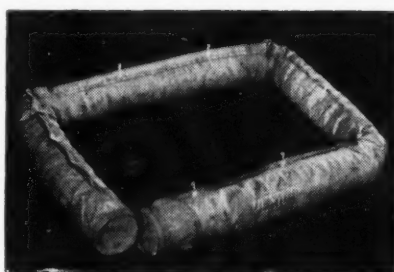
A husky 3" CMC Dual Prime. One of the complete line from 1½" to 10" sizes. Also 3" and 4" Diaphragms. Get catalog.

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NON-COLLAPSIBLE HELICAL-TYPE "VENTUBE"*

HELICAL-TYPE "Ventube" has a tempered steel inner spring that keeps tubing flexible and expanded, maintains maximum air flow.



HELICAL-TYPE "Ventube" bends easily, can be turned sharply in any direction without appreciable reduction of air flow.



HELICAL-TYPE "Ventube" accordion-folds at a ratio of 15 feet to 20 inches. This means easy handling, compact storage.

► Here's a new work-speeder for all contractors! Du Pont non-collapsible *Helical-Type* "Ventube" carries fresh air to or exhausts foul air from workers in sewers, tunnels, and other confined areas. And tests by ship-builders show that *Helical-Type* "Ventube" does this job better by 60% (at 2½" water suction) than regular non-collapsible "Ventube"!

Helical-Type "Ventube" assures a steady flow of air no matter the degree at which the tubing is bent. Doubled back at 180°, it will exhaust 8 times more air than regular non-collapsible "Ventube." Yet, size for size, it weighs but half as much!

Learn the many ways in which Du Pont's new *Helical-Type* "Ventube" can serve you! Just clip the coupon below. It will bring you many helpful facts on this time- and cost-saving Du Pont development. E. I. du Pont de Nemours & Co. (Inc.), "Fabrikoid" Division, Fairfield, Conn.

*"VENTUBE" is Du Pont's trade mark for its flexible, synthetic-rubberized ventilating duct.

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"VENTUBE"

Reducing Costs Through
Better Ventilation

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...THROUGH CHEMISTRY

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THAT WILL
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These advanced single-acting hammers are now available in five standard sizes, with a striking energy range from 9,000 to 37,500 ft. lbs. per blow, delivered at a low striking velocity. This makes McKiernan-Terry Single-Acting Hammers the contractor's wise choice for use in penetrating dense substances—stiff blue clay, heavy "gumbo," incipient shale, hard pan, etc. Also for handling heavy mass piles, such as pre-formed concrete, without excessive strain on piling or wear on ram and anvil block.

Write for Full Information



McKiernan-Terry Bulletin No. 57 gives diagrams, specifications, operating notes, etc. Copy sent free on request.

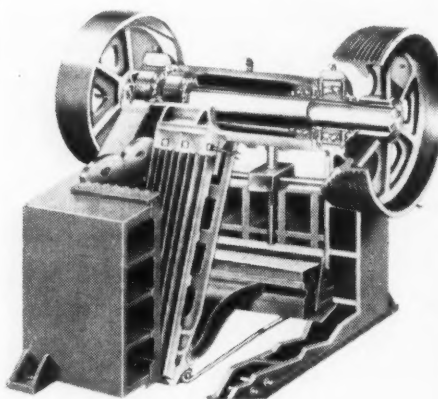
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CORPORATION
Manufacturing Engineers
14 Park Row New York 7, N. Y.

(Continued from page 149)

glove; and glove for resisting rough wear on all-purpose jobs. Mittens include heat mitten for drop forging, die casting and bending block work; steel-studded mitten for steel workers; and asbestos mitten for heat-treating operations and for coil tying in steel plants. Cover-mitt fits over gloves and mittens and is designed to add materially to their life while hand pads are designed to wear over cotton or lightweight leather gloves. Leather sleevelet provides arm protection on heavy-duty jobs. Sta-Set finger cots protect both front and back of fingers. Two pairs of spats are designed for foundry and chemical workers. Ladder shoes prevent accidents caused by skidding or creeping ladders.—**American Optical Co., Southbridge, Mass.**

JAW CRUSHERS—Welded base roller bearing jaw crushers are overhead eccentric type made in 10x16-in., 20x36-in., 24x36-in. and 30x42-in. openings. They have rugged welded

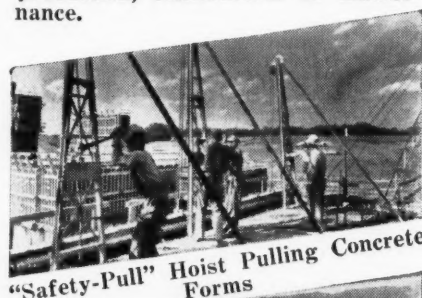


steel plate bases and SKF roller bearings. Two distinct crushing blows with each revolution of shaft are produced by high eccentric and radial toggle action.—**Universal Engineering Corp., Cedar Rapids, Iowa.**

MOTOR CLEANING SOLVENT—Stano-Purge is material chemically related to toluene which removes sludge, gum and resin from engines. It contains special additive which provides lubrication, thus eliminating danger of engine damage; causes foaming, thus making sure that upper parts of engine are reached and cleaned by solvent; and is excellent detergent, thus insuring that all suspended dirt will be carried out. Stano-Vim is low-viscosity, low-volatility fluid for purging intake systems of engines. It performs for combustion chamber and its related mechanisms same function as Stano-Purge does for crankcase. — **Standard Oil Co. (Indiana), 910 S. Michigan Ave., Chicago, Ill.**



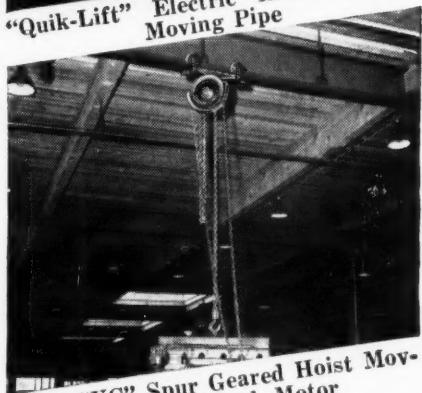
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Model "YC" Spur Geared Hoist Moving Large Truck Motor

There is a **COFFING HOIST** to meet your requirements. Contact your supply house for detailed information or write for our Bulletin Form 4.

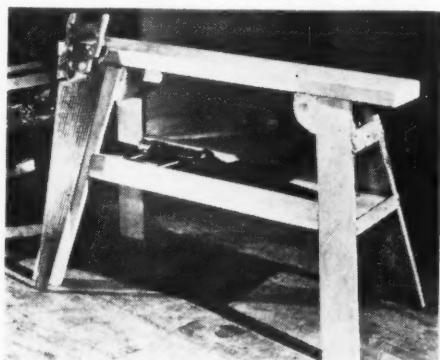
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EXCAVATOR—Model IT4 Traxcavator is mounted on and powered by Caterpillar D4 track-type tractor. Standard bucket is 1-cu. yd. capacity and suited for digging, excavating, grading, loading, material handling and all general uses. It is wider than tractor tracks so that it will trim close alongside curbs and walls, trim



side walls and corners of excavations neatly and maintain grades easily. Bulldozer blade, quickly installed in place of bucket, anglegrader and other attachments are available. Tractor drawbar is always free for hauling work. Mechanical hoist is driven from front power take-off of tractor through V-belt drive, so is independent of tractor clutch and transmissions. Bucket can be dumped from any point of lift and has digging range from 14 in. below track line to 56 in. above. It is tilted back 30 deg. during first part of lift, minimizing spilling and delivering full load.—Trackson Co., Milwaukee 1, Wis.

FOLDING SAW-HORSE—In knocked-down form, this saw-horse is 8x8x42 in. and occupies less than one-quarter of space required for old-fashioned type. It is assembled



with 14-gage steel hardware, cadmium plated to prevent rusting, and has 2x6x42-in. clear white pine top and 9x36-in. tool tray. All hardware is out of the way to prevent chance of nicking saw or other tools.—Unique Tool Products Co., 4632 Clark St., Chicago, Ill.

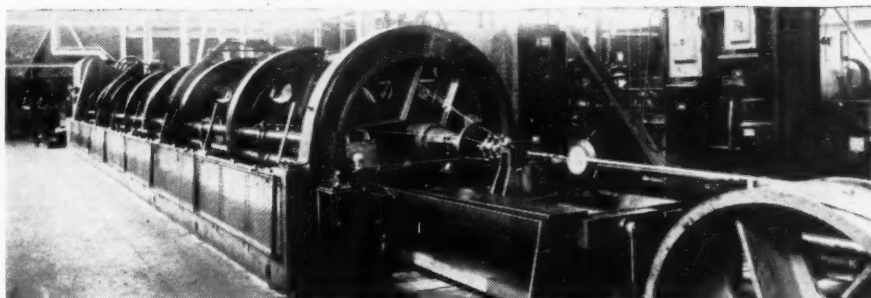
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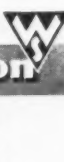
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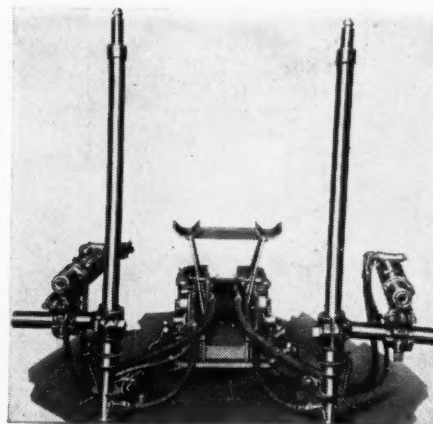
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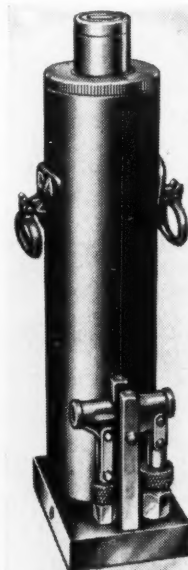
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Also Builders of Portable and Stationary Asphalt Plants of All Types and Capacities.

DRILL-JUMBO MOUNTING—New DJM air-operated drill-jumbo mounting for use in tunnelling work consists of air column, rack and column-arm lifting device and linkages for proper attachment to carriage. Column piston has a 2¾-ft. extension and different column lengths are available for various heights of back. Columns cannot fall over. Check valve maintains



full air pressure for adequate length of time in case of break in air lines or power failure. Drifters are easily swung into desired drilling position. As there is no need for manually hoisting heavy column arm and machine, lifter holes can be drilled first if so desired. For breast and back holes crank on arm-raising device moves arm and drifter up column or down. There is no chance for pinched fingers. Physical exertion and strain are done away with.—Ingersoll-Rand Co., 11 Broadway, New York, N. Y.



HYDRAULIC JOURNAL JACK—These 50-ton jacks are specially designed for general highlifting jobs

in railroad repair shops, for bridge work and for heavy general industrial lifting. They have two speeds—fast for quickly raising light or medium-heavy loads and normal or standard for raising capacity loads. Raising is by easy pumping

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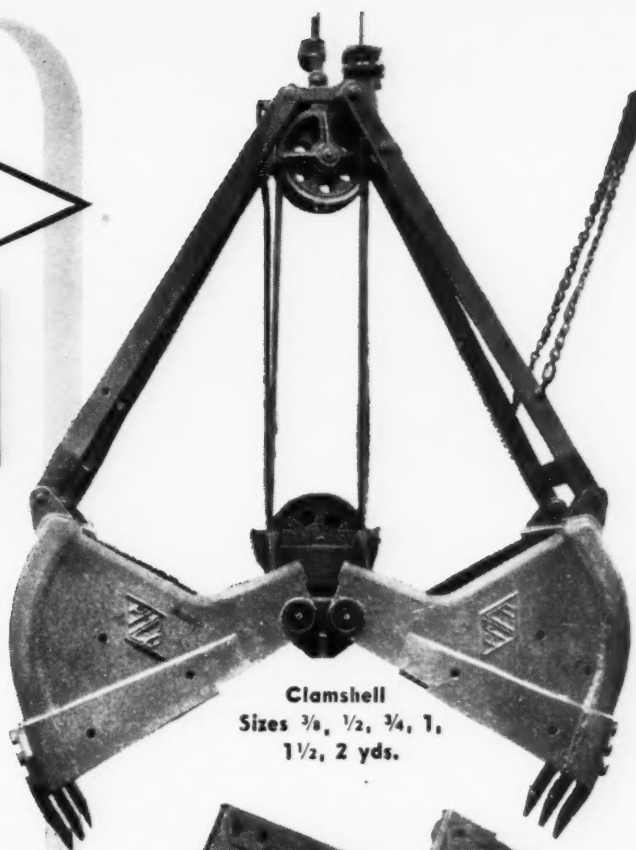
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• FRONTS, BOTTOMS, SCOOPS and TEETH are 14% manganese steel developing tensile strength up to 120,000 p. s. i. This high percentage manganese steel gives tough, rugged strength for hard service and allows wide set corner teeth for easy entrance in digging. Volume production methods enable us to build a better bucket with amazing economies in manufacturing.

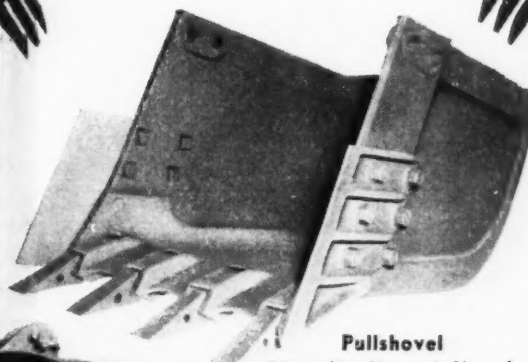
On the 1/2 yd. and 3/4 yd. Shovel, Pullshovel, and Dragline Buckets, all teeth are interchangeable — a great advantage to operators.

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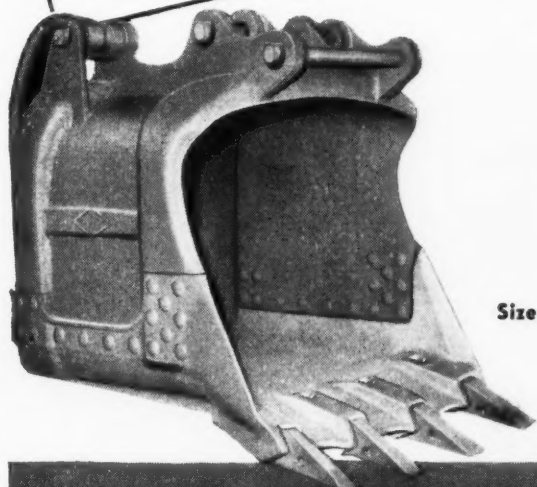
See your shovel man or equipment dealer about PMCO Buckets and Dippers.



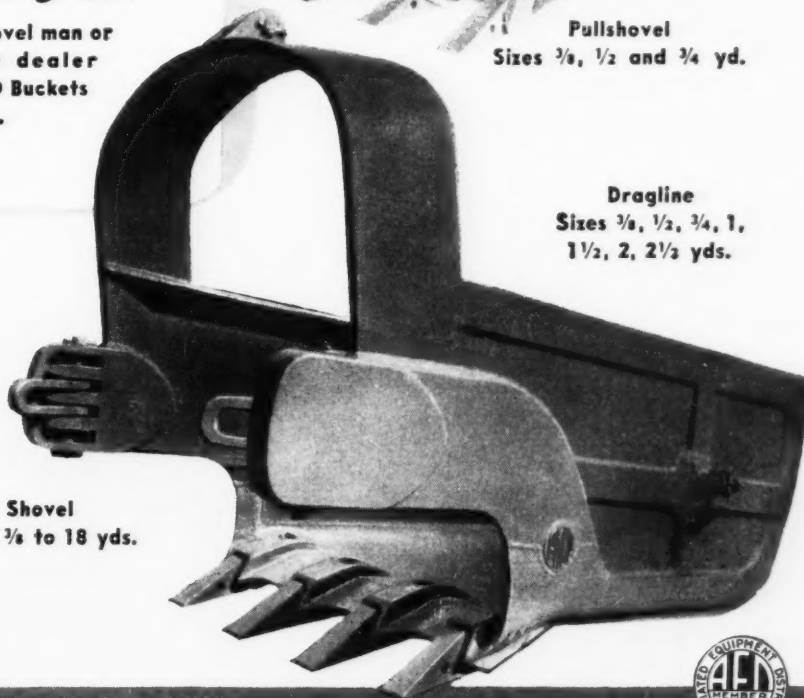
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Sizes 3/8, 1/2, 3/4, 1, 1 1/2, 2 yds.



Pullshovel
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Sizes 3/8 to 18 yds.



Dragline
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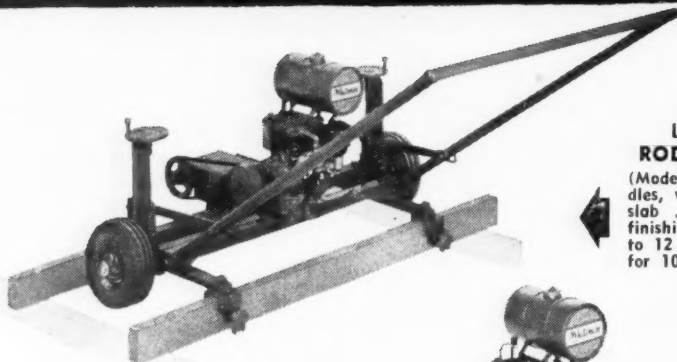
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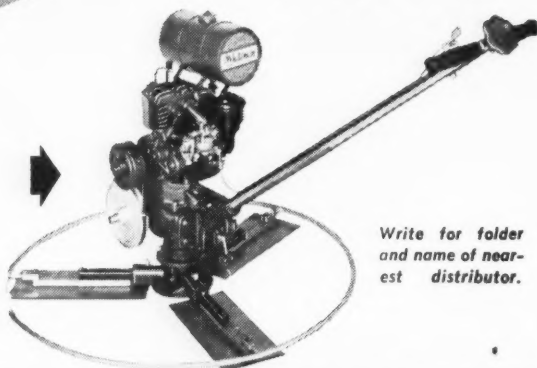


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For level finishing . . . for either traction or smooth surfaces. Only 105 lbs., 35" diameter. Also in Model "B", 46" diameter.



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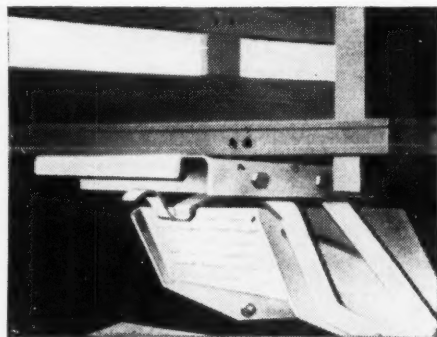
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EXPERIENCE *builds 'em* • PERFORMANCE *sells 'em*

TILTING CONCRETE MIXER—New mixer is furnished with either pneumatically tired wheels with Timken bearings or steel wheels and is equipped with Briggs-Stratton engine, all-steel drum bowl and telescoping



towing bail. It has mixing capacity of 3 cu. ft. of mixed concrete. Overall dimensions are: height, 52 in.; width, 33¾ in.; length with towing bail in, 70 in. Net weight with 1.6-hp. engine is 600 lb.—**Muller Machinery Co., Inc.**, P. O. Box 248, Metuchen, N. J.

FOLDING TRUCK STEPS—Engineered for use on flat racks, stake bodies, vans, trailers and semi-trailers, and easily installed with four bolts, Model R-16 folding truck steps is designed for installing on rear of truck. It may be mounted in center or at either side. In closed position steps compactly fold under truck bed. When simple trip is manually oper-



ated, two sturdy 16-in. slip-proof steps instantly swing down and lock in open position. Slight lift and push on the bottom step swings and folds them back under truck bed where they are automatically locked in closed position. Another style, Model S-16, is designed for side or "tight spot" mounting. Body alterations are not necessary to install Saf-T-Steps. Four bolts securely mount them to the under side of truck platform. All metal and built to support weight of 1,000 lb., step weighs only 40 lb.—**Safety Step Co.**, 1017 South La Brea Ave., Los Angeles 35, Calif.

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use

TUNNELING—(271 pp., illustrated). Far beyond scope of most manufacturers' publications, "Rock Tunneling with Steel Supports" is both textbook and excellent reference piece, indispensable in every tunnel man's library. Opening chapters are brief treatise of geology and mechanical defects in rocks (main reason for ground support), and ground pressures on tunnel lining, followed by discussion of engineering design and application of steel ground supports. Written in practical and informative vein, book contains many illustrated examples of all types of steel timbering systems used on various tunnel projects. The authors, R. V. Proctor and T. L. White, vice-president and chief engineer, respectively, Commercial Shearing & Stamping Co., in collaboration with Karl Terzaghi, consulting engineer, have produced authoritative, interesting and useful reference for both tunnel designers and builders. Even section devoted to company's products is more informative than commercial. List price \$2.50—Commercial Shearing & Stamping Co., Youngstown, Ohio.



PROTECTIVE PACKAGING—(12 pp., illustrated) Features waterproof paper-lined textile bags which provide protection against change in moisture content, contamination, sifting

losses, undesirable odors, insect infestation and loss of aroma. Tailor-made for each product, they are said to be economical and easy to use.—Bemis Bro. Bag Co., 408 Pine St., St. Louis 2, Mo.

STEEL PILING—(20 pp., illustrated) Describes Corr-Plate piling, formed by cold-rolling process, which makes corrugations and strength of piling uniform throughout. Diagrams, tables, dimensions and weights given in catalog make it easy to figure requirements of any piling job, select amount needed and estimate cost—Caine Steel Co., Chicago 39, Ill.

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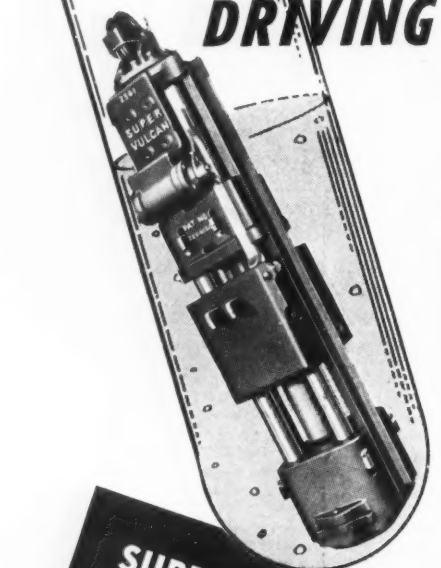
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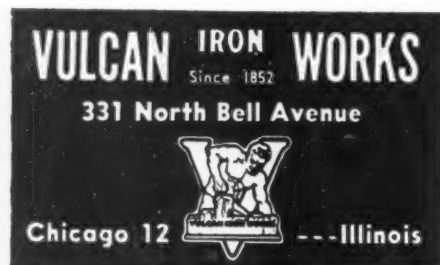
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Get the advantages delivered by Super-Vulcan. Save time, trouble and money. Write for details.



PRIMARY CRUSHING UNIT—(4-p. bulletin) Describes 546-P, which is complete primary crushing unit mounted on gooseneck chassis and equipped with pneumatic tires. It consists of shovel loading feed hopper, apron feeder, bar grizzly and by-pass, jaw crusher, underconveyor and power unit. Bulletin also contains detailed information concerning unit's use in various types of set-ups.—**Universal Engineering Corp.**, Cedar Rapids, Iowa.



ELECTRODES—(16-p. bulletin) Describes new type of electrode designed to prevent underbead cracking in welding steels. It gives complete information on Type HTS, lime-ferritic electrode. In addition to descriptive matter, tables give full data on physical properties and chemical analysis of Type HTS deposit in all standard electrode sizes. Also included is information on effect of stress relieving and comparative deposition characteristics of this and other mild steel electrodes. Various actual applications are discussed, along with advantages from its use.—**Metal & Thermit Corp.**, 120 Broadway, New York 5, N. Y.

WATERPROOFING AND DAMPPROOFING—(16 sheets) Gives specifications for waterproofing with mass concrete, cement plaster coat and floor topping, cement stucco and iron, and for clear or bituminous dampproofing. Other subjects covered include curing concrete, swimming pool coating, coating for concrete and cinder block, nonshrinking mortar, and acid proofing floors.—**Truscon Laboratories**, Detroit, Mich.

MOTOR GRADERS—(12 pp., illustrated) Tells story of methods utilized in various phases of highway construction and maintenance, including surface maintenance, modernizing, ditching, scarifying, grading, bank sloping, breaking, excavating, drifting in normal conditions, "winterizing" and snow plowing. Also shows use of motor grader in airport construction and city expansion and improvement.—**Caterpillar Tractor Co.**, Peoria 8, Ill.

WIRE ROPE CLIPS—(Pocket-size card) Lists number of clips required for various rope sizes. Describes correct method of fastening Crosby clips and furnishes application data.—**American Hoist & Derrick Co.**, St. Paul 1, Minn.

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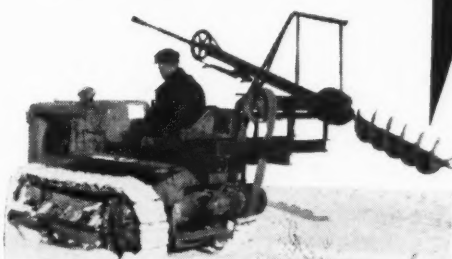
WELDING AND FLAME CUTTING—(28 pp., illustrated) Covers recommended practices for welding and flame cutting of wrought iron pipe and flat rolled products. Contains comprehensive welding chart that can be removed and tacked on wall.—**A. M. Byers Co., Pittsburgh, Pa.**

CENTRIFUGAL PUMPS—(8 pp., illustrated) Covers horizontal, split-case, multi-stage, high-pressure pumps for use with motor, steam turbine or engine drives. Applications include high-pressure boiler feeding, high-pressure water supply in skyscrapers, small municipalities, industrial plants, etc., hydraulic elevator service, and quick feeding of hydraulic presses.—**Economy Pumps, Inc., Hamilton, Ohio.**

CORRECT LUBRICATION IN CONSTRUCTION INDUSTRY—(12 pp., illustrated) Provides practical guide for selecting right lubricants for construction equipment with typical examples of rope selection as it applies to principal machines. Pictures equipment designed to meet varied lubricant services needed for maintaining truck fleet and recommends methods of handling to eliminate waste and contamination.—**Alemite Division, Stewart-Warner Corp., 1826 Diversey Parkway, Chicago, Ill.**

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Welded Manganese Steel Dipper "Thrives" on Tough Limestone In Underground Quarry . . .

In the underground quarry of the Louisville Crushed Stone Co., 150 to 160 tons of shot limestone per hour are removed by a Lorain 82 shovel, equipped with a 2 yd. Amsco "stream-line" welded dipper, as shown in Picture R-784. The material is loaded, as shown in Picture A-517, into three trucks, which haul it to a feeder serving a 28" x 36" jaw crusher.

In this picture also the large chunks of limestone among the material handled are visible. Plenty of heavy impacts as well as severe abrasion are the constant portion of the dipper on this job.



R-784. The Amsco all-manganese steel "stream-line" welded dipper as used on Louisville's shovel.

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creasing its resistance to abrasion to a maximum degree. As the work-hardened surface of manganese steel is self-renewing,



A-517. 2-yd. Amsco dipper on Lorain 82 loading shot limestone.

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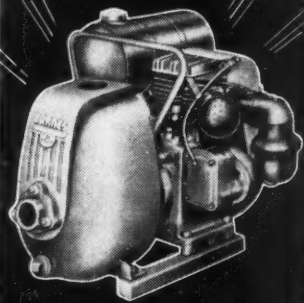


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steel erecting and material-handling jobs are illustrated. — **Link-Belt Speeder Corp.**, 307 N. Michigan Ave., Chicago, Ill.

DIESEL TRACTOR—(24 pp., illustrated) Gives facts about HD-7 tractor, with General Motors two-cycle engine, unit injector, transmission construction and "Positive" sealed truck wheels. Specifications list figures such as 60-drawbar horsepower, five speed ranges, engine dimensions, fuel capacities, shipping weights and track design.—**Allis-Chalmers Mfg. Co.**, Tractor Division, Milwaukee 1, Wis.

PLYWOOD FOR INTERIORS—(20-p. brochure) Gives clear, complete descriptions and illustrations of field installations including details ranging from primary planning of job to final finishing of plywood. Includes instructions for erecting plywood walls and ceilings in new construction or over existing masonry or plaster; treatment of joints, corners, base and ceiling trim; fitting plywood around windows and doors, and arranging paneling to bring about various effects. Pictures show new snap-in rounded corner; inexpensive stile and rail panel effect; Plankweld, edge-grooved plywood; built-in features and various designs for paneling straight plywood and Weldtex, striated fir plywood. Three methods of finishing—natural, pickle pine and white pore—are described.—**United States Plywood Corp.**, 55 W. 44th St., New York 18, N. Y.



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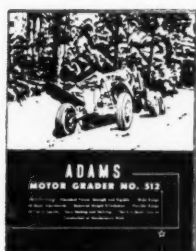
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BRAKE LININGS AND CLUTCH FACINGS—(44-p. catalog) Furnishes recommendations and installation instructions and describes various industrial applications for industrial linings and blocks. Contains specific lining recommendations for wide variety of makes and models of industrial equipment, giving number and type of bands used, drum diameters, width, thickness and length of lining; number of pieces of lining used; and Grey-Rock part number. Also contains complete clutch facing recommendations giving manufacturer's part number, number of facings required, BLMA number, dimensions and drilling pattern.—**United States Asbestos Division, Raybestos-Manhattan, Inc.**, Manheim, Pa.

GASOLINE-ENGINE-DRIVEN GENERATORS — (4-p. folder) Pictorially describes standard line of generators which uses improved designs and new materials. On-the-job photographs illustrate advantages of portable power plant. Generator sizes range from 500 to 5,000 w., a.c. or d.c., 6 to 230 v., 50 to 800 cycle. Weights vary from 48 to 142 lb.—**Homelite Corp., Port Chester, N. Y.**

ARC WELDING ACCESSORIES— (8-p. folder) Announces complete new line for welding trade. All items are identified with catalog numbers. They include face shields, electrode holders, cables, cleaning brushes, overalls, coats, pants, gloves, and aprons.—**Hobart Brothers Co., Troy, N. Y.**



MOTOR GRADER — (Catalog) Covers No. 512 motor grader, company's first new post-war model, which features "high-arch" front axle and full-floating front axle. Machine is product of 5 yr. of research

and experimental work and has been job tested on every type of road-building work.—**J. D. Adams Mfg. Co., Indianapolis 6, Ind.**

CHEMICALS AND INDUSTRIAL EXPLOSIVES — (44-p. booklet) Indexes products according to various industries in which they are used and also according to chemical families. Chemicals discussed include cellulose and rosin families, synthetic resins, terpene solvents and chemicals, chlorinated products, explosives, blasting supplies and sporting powders and special products.—**Hercules Powder Co., Wilmington, Del.**

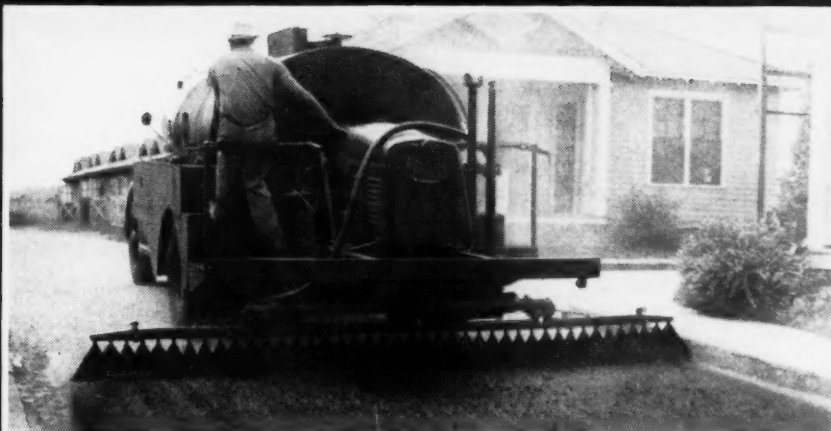
JOINT COVER — (4-p. folder) Announces availability of Perfection joint covers, expanding metal protection for mortar joints in masonry. Method of setting covers is illustrated.—**Dusing & Hunt, Inc., 1927 Elmwood Ave., Buffalo 7, N. Y.**

CUTTING CAST IRON—(16-p. circular) Tells how to cut with oxyacetylene flame. Included is discussion of proper types of equipment, preheating conditions, cutting positions, need of adequate protective clothing, proper oxygen and acetylene pressures, etc. It is intended to simplify methods, procedures and techniques.—**National Cylinder Gas Co., 205 W. Wacker Drive, Chicago 6, Ill.**

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EQUIPMENT MEN *and Their Companies*



L. O. McLean has been appointed sales manager of The General Excavator Co., Marion, Ohio, manufacturer of shovels, cranes, draglines and other material handling equipment. He first associated with this company in 1920 and succeeds **Don B. Smith**, who has resigned. Mr. McLean has had extensive experience in the construction and construction equipment industry and founded the McLean Construction Co. in Pittsburgh.

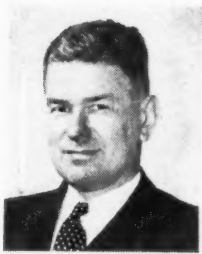
Allied Steel Products, Inc., Cleveland, Ohio, announce the appointment of The Taft Welding Equipment Co., 3171 Main St., Springfield, Mass., as direct factory agents in the territory consisting of Connecticut, Rhode Island and western Massachusetts. The company manufactures Bulldog grip-lugs, Mango repointer bars and "Excelloy" hard surfacing material.

Kenneth F. Kichman has been appointed district manager of the Beckwith Machinery Co.'s Harrisburg office. He has been active in the Harrisburg territory for some time and has worked in the company's parts department and served as parts department manager. In 1934 he was associated with Stouffer Tractor and Equipment Co. and the Barnard Tractor and Equipment Co.

Emerson H. Todd has been appointed sales manager of American Cable and Hazard Wire Rope Divisions of American Chain & Cable Co., Inc., succeeding **Frank W. Remis** who resigned to enter another line of business in Omaha, Neb. **George Gunther**, with the company prior to his service with the armed forces, has been appointed Chicago district manager for the wire rope divisions succeeding Mr. Todd.

W. E. Difford, managing director of Douglas Fir Plywood Association for the past eight years will leave the trade-promotion organization July 1, it is announced by **E. W. Daniels**, president of Harbor Plywood Corp. of Hoquiam, Wash. **Harrison Clark** of Tacoma, assistant to Mr. Difford, has been named acting managing director.

Follansbee Metal Warehouses, a division of Follansbee Steel Corp. has purchased the steel warehouse facilities of Williamson Brothers Co., Fairfield (Bridgeport), Conn., and will assume operations July 1. This extension of service into New England will be in addition to warehouses presently operated by Follansbee Metal Warehouses at Rochester, N. Y., and Pittsburgh. The company announced recently that it has concluded negotiations to lease the steel production equipment and the mill section of The Parkersburg Steel Co. plant, Parkersburg, W. Va.



Norman B. Obbard, formerly assistant to the vice president of American Bridge Co., Ambridge, Pa., subsidiary of U. S. Steel Corp., has been named vice president in charge

of sales and a director, effective July 1, to succeed **Eugene H. Heald**, who retired.

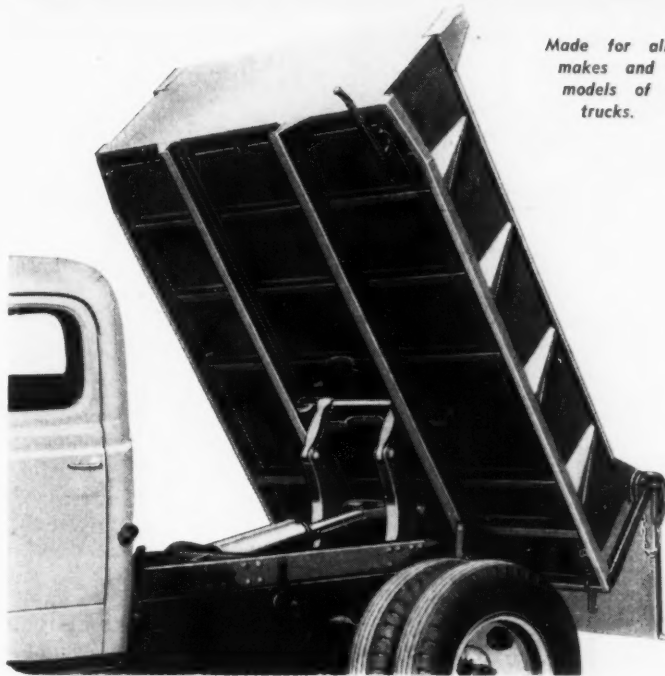
Frank M. Williams, has been added to the technical staff of the Clay Sewer Pipe Association, Inc. He has been connected with the Ohio State Department of Highways since 1923 except for three years' service with the United States Signal Corps. Mr. Williams is to be district engineer of the association representing the state of Ohio.

Appointment of Paul Merkert, Jr., and Robert Miller to the sales engineering staff of the Cummins Engine Co., Inc., Columbus, Ind., has been announced. Both Mr. Merkert and Mr. Miller joined the company upon their release from active duty with the U. S. Navy.

Marvin Greenwood, general sales manager of The Celotex Corp., announces the following personnel changes in the company's sales division: **E. C. Rautenberg**, formerly manager of the Chicago office has been appointed assistant general sales manager with headquarters in Chicago. Mr. Rautenberg is succeeded by **E. E. Dierking** who comes to Chicago from Cleveland where he was manager of the Celotex branch office. **George J. Dinges** has resumed his position as manager of the Celotex Atlanta branch, and **Allen Cassin**, becomes manager of the Cleveland branch.

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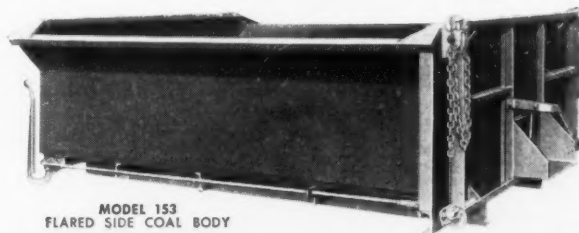
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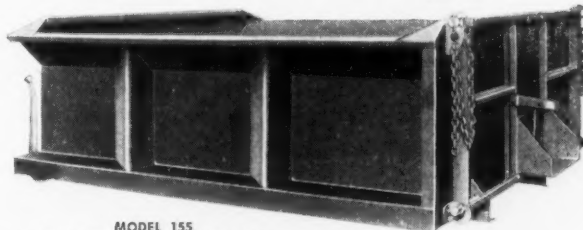
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Simplex No. 50HJ Hydraulic Jack, capacity 50 tons. Low height 12", hydraulic lift 7". No. 30HJ, same double pump design, capacity 30 tons. Also 3, 5, 8, 12 and 20-ton Hydraulic Jacks.



Jobs involving the lifting of heavy loads are not man-hour-eaters when Simplex Hydraulic Jacks are at hand. Smooth, speedy leakproof operation is built into these rugged Jacks. Well balanced, with convenient carrying handle that provides for easy placement. Double lever socket speeds close quarter operation. Safety is enhanced by non-deteriorating pressure seals, shielded release valve and an in-built over-load safety factor of 50%, to which each Simplex Jack is tested before shipment.

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Steven F. Evelyn has been named consulting engineer of construction equipment products of Worthington Pump and Machinery Corp., Holyoke, Mass. Howard Platts succeeds him in his former position of chief engineer of the portable compressor division. L. S. Riedel has been appointed regional manager of the construction equipment division of the Worthington Pump and Machinery Corp., 748 Bruckner Blvd., Bronx, New York.

Superior Concrete Accessories, Inc., moved into its new building, 4110 Wrightwood Ave., Chicago 39, Ill., July 1. Both office and plant are at the new location.

Ray E. Arnold has been appointed district representative for LaPlant-Choate Mfg. Co., Inc., at Portland, Ore., succeeding G. H. Taylor, who has been transferred to the main office of the company at Cedar Rapids, Iowa. Mr. Arnold has had considerable experience as a county engineer and as an engineer with the Minnesota State Highway Department. He will contact LaPlant-Choate distributors and users of LaPlant-Choate earthmoving equipment in Oregon, Washington and British Columbia.

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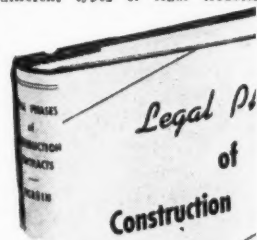
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- right to recover for increased cost of work due to unforeseen conditions, or due to delays caused by acts of the other party
- provisions to the effect that the engineer will determine all questions arising out of the work and his decisions shall be final and conclusive upon the contractor
- responsibility of contractor for damages done to property
- varying the terms of a written contract
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Gar Wood Industries, Inc., has expanded its manufacturing facilities by purchasing from the War Assets Administration the former Bendix plant in Wayne, Mich., it was announced today by **John J. Bergen**, chairman, and **Charles W. Percelle**, president. The company will transfer all its Detroit operations to the new site with the exception of its body plant. Gar Wood will manufacture in its new plant hydraulic hoists, steel bodies, winches, cranes and derricks for motor trucks, hydraulic systems and attachments for bulldozers, scrapers and other tractor equipment; oil burners, gas burners, oil and gas-fired hot air heating units, oil and gas-fired boiler units, ventilating fans and hot water heaters.

Capital structure of the Hercules Steel Products Co., Galion, Ohio, has been reorganized, although it will continue operation as an unincorporated subsidiary of the newly set up Hercules Steel Products Corp. of Delaware, the latter serving as holding company for the subsidiary and controlling the stock of The Galion Metallic Vault Co. There is no change in the management of either of the operating companies.

Ernst Gruenwald, with Lone Star Cement Corp. since 1926, has been made manager of the "Incor" and Technical Service branches of the company, succeeding **Purd B. Wright**. Mr. Gruenwald, an engineering graduate of the University of Vienna, has served as concrete designer and has been in Lone Star's Technical Service branch since 1932.

Utilizing by-products from Henry J. Kaiser's iron and steel plant at Fontana, Calif., the Mineral Wood Insulations Co. has announced the start of a \$100,000 building program to manufacture insulation materials on property leased from Kaiser Co., Inc. The new company expects to get into production by Sept. 1 and will serve the western states and markets in the Orient. Plant capacity is designed for annual capacity of 50,000 tons with initial operations calling for 20,000 tons.

Thermoid Rubber Division of Thermoid Co., Trenton, N. J., has announced the appointment of **Edward C. Hoeflich** as industrial sales promotion manager.

A. M. Byers Co., of Pittsburgh, Pa., has appointed **Alfred B. Dastrup** as manager of the Alloy Steel Sales Department. He has been associated with the company since 1931.

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No. 89 1/2" Drill \$29.95

EACH month, more SpeedWay Drills come off the production line; are being shipped each day. But, frankly, though we are beginning to cut into our mountainous pile of back orders, there's a deal of waiting still for a lot of people who are ordering SpeedWay Tools today. However, because they are worth waiting for, we suggest that you place your order now with your local SpeedWay dealer for earliest possible delivery.

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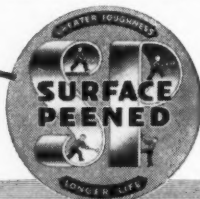
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Construction Equipment Division of the Worthington Pump & Machinery Corp., of Harrison, N.J., has announced the appointment of **George H. Allen** as sales promotion specialist for Blue Brute rock drills to the mining industry. Mr. Allen served 42 months with the Army Air Forces, attaining the rank of lieutenant colonel.

Cornell E. Jones, formerly a major in the Army Corps of Engineers, has been named sales development manager of Caterpillar Tractor Co., Peoria, Ill. **L. B. Neumiller**, Caterpillar president, recently announced plans for constructing six new buildings which will add more than 180,000 sq. ft. of floor space to the Peoria plant. Completion is scheduled for the summer of 1948.



All service activities of Pioneer Engineering Works, Minneapolis, Minn., have been consolidated under the direction of **Harold E. Rolin**, manager, sales engineering. He

joined the company in 1929 as a draftsman and later served as chief draftsman, chief engineer and night superintendent of shops.

The Pump with the "Built-In" Insurance Policy!



Yes, every contractor's pump bearing an AGC rating plate has a built-in insurance policy. For that plate is your assurance that the pump will deliver full rated capacity . . . that not only pump size but performance and capacity are guaranteed as well.

Many a contractor buys his pumps on size . . . that is, on the size of the suction and discharge openings. But, unless the pump has earned the right to bear an AGC rating plate, size alone does not measure capacity.

Buy pumps bearing the AGC rating plate, and be sure in advance of capacity and performance.



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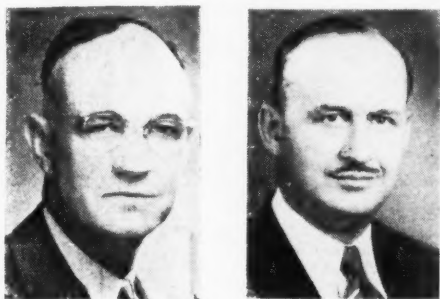
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JAEGER MACHINE CO. Columbus, Ohio	Affiliated with	THE GORMAN-RUPP CO. Mansfield, Ohio
G. H. & E. MANUFACTURING CO. Milwaukee, Wis.	THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.	NOVO ENGINE CO. Lansing, Mich.

Appointment of Walker Penfield as manager of manufacturing has been announced by the Pennsylvania Salt Manufacturing Co., of Philadelphia. **Claude S. Beldin**, regional superintendent, has been named production manager, with **Henry G. Meyer** as his assistant.

John C. Donnelly, previously associated with Mussels Canada, Ltd., for many years, has recently become connected with the Duke Equipment Co., Montreal, distributors of construction, roadbuilding and industrial equipment.

Staff of field welding engineers of The Lincoln Electric Co., Cleveland, Ohio, has been augmented by the following additions: **Gordon Appleby** has joined the welding engineering staff of the Philadelphia branch office; **Terril S. Hoffman** has been assigned welding engineer in the St. Louis area; **E. James Langhurst** was named welding engineer in the Chicago territory; **Garret S. Parsons** has returned to the Los Angeles branch office as welding engineer after three years of Army service.

A. W. Herrington, chairman of the board of directors of Marmon-Herrington Co., Inc., Indianapolis, Ind., announced that **Bert Dingley** (left) is retiring as president of the com-



pany, effective July 1. He is to be succeeded by **David M. Klausmeyer** (right) who has resigned as plant manager of Chevrolet Commercial Body Division of General Motors Corp.

★ ★ ★

Contractor Problems

(Continued from page 101)

meet outside competition for their services.

(2) There has been a considerable increase in the cost of doing business. This condition is not peculiar to highway affairs, but is common to all activities today.

Overhead Costs Doubled

Overhead expenses today, as compared with conditions before the war have more than doubled, Mr. Parrott said. One case was cited of 25 long distance telephone calls in an effort to expedite the delivery of only one carload of lumber. Similar conditions prevail in delivery of equipment and other commodities.

Many of these increased costs, Mr. Parrott said, are due to factors beyond the contractor's control. Where heretofore the contractor handled these overhead items himself, they are so numerous today that several people must be hired for this purpose.

Mr. Parrott said that low production is not all the fault of inefficient labor. There are so many intangibles, so many bottlenecks, one or more of which are hindering the work 90 per cent of the time, that regardless of their willingness or ability, contractor's crews cannot make headway, he said. This all adds up to a big overhead for lowered production.

Brownhoist Buckets for faster material handling

The deep-digging, hungry mouths of Brownhoist Clamshell buckets speed up the handling of coal, ore, gravel, dirt, cinders, clay, etc. Large sheaves reduce rope wear and maintenance. Sturdy construction and latest design insures long life. Available in rope-reeve, power-wheel and link type. Industrial Brownhoist Corporation, Bay City, Michigan. Offices in New York City, Philadelphia, Pittsburgh, Cleveland and Chicago.



BROWNHOIST BUCKETS GIVE MORE
YEARS OF TROUBLE-FREE PERFORMANCE

WHERE TO BUY

Featuring additional Products and Specialties for the Construction Industry

COMPLETE WELL POINT SYSTEMS WILL DRY UP ANY EXCAVATION

Faster—More Economically

Write For Job Estimate and 32 page Catalog

COMPLETE

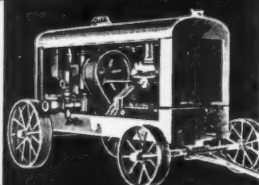
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Tel. IRonsides 6-8600
Branch: Third Avenue & Adams St., Gary, Indiana
Telephone: Gary 23983

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Triplex Road Pump

For road paving work a good strong pump is needed to supply water for the paving mixer and other equipment on the job. Capacities from 30 to 150 gals. Write for Bulletin



SALES, PUMPS, MIXERS, MOISTURE MIXERS, TANDUM ROLLERS, BAG BENEFICIERS, BAG CUTTERS
C. H. & E. Manufacturing Co.
Milwaukee, Wis.

SEARCHLIGHT SECTION

Additional Searchlight ad on opposite page

CONSOLIDATED STEEL CORPORATION LOS ANGELES

NEEDS
DESIGN ENGINEERS
DRAFTSMAN-DETAILERS
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AND
ESTIMATORS-LABOR COSTS
EXPERIENCED IN
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BUILDINGS, BRIDGES, ETC.

CONSOLIDATED STEEL CORPORATION

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3 ton-4 ton Mancha battery Loco-
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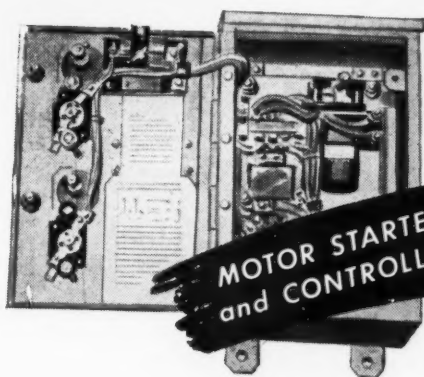
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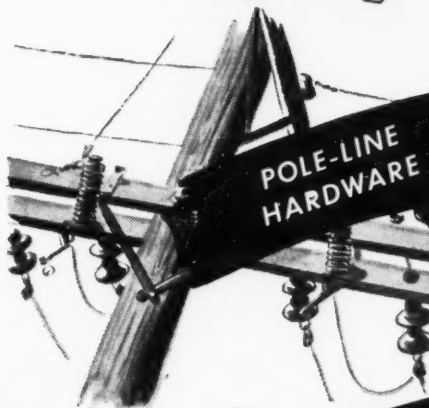
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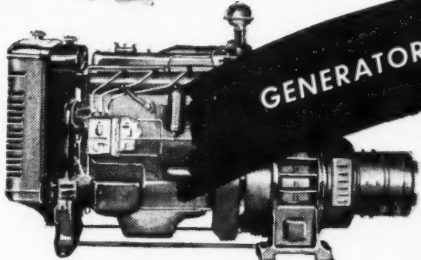
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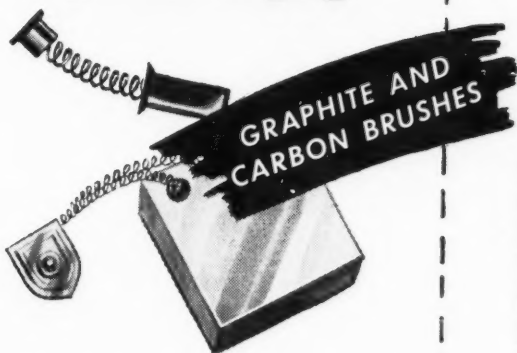
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and CONTROLLERS**



**POLE-LINE
HARDWARE**



GENERATORS



**GRAPHITE AND
CARBON BRUSHES**

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AT REDUCED PRICES

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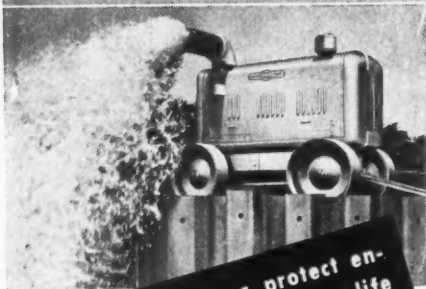
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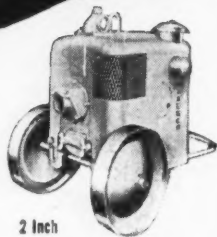
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JAEGER BUILDS BETTER PUMPS INSIDE and OUT



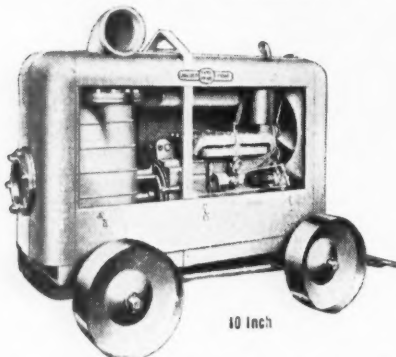
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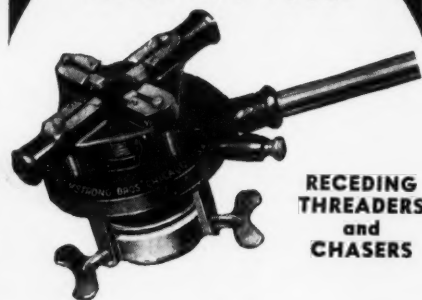
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BETTER PIPE TOOLS



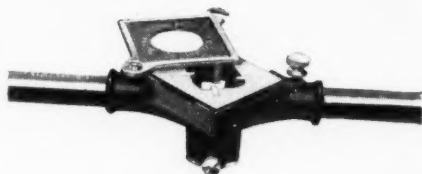
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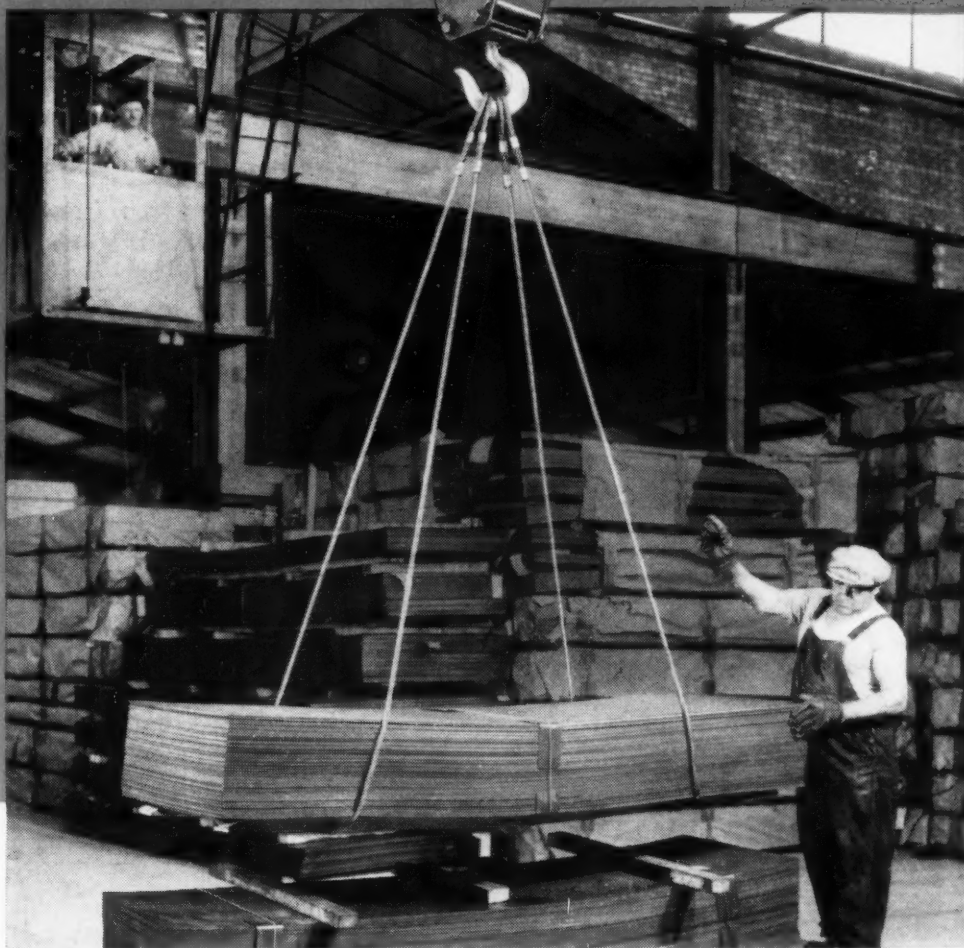


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Moving 500,000 Cubic Yards On **TIMKEN BEARINGS**



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